

UMASS/AMHERST



312066005396608

LIBRARY OF THE

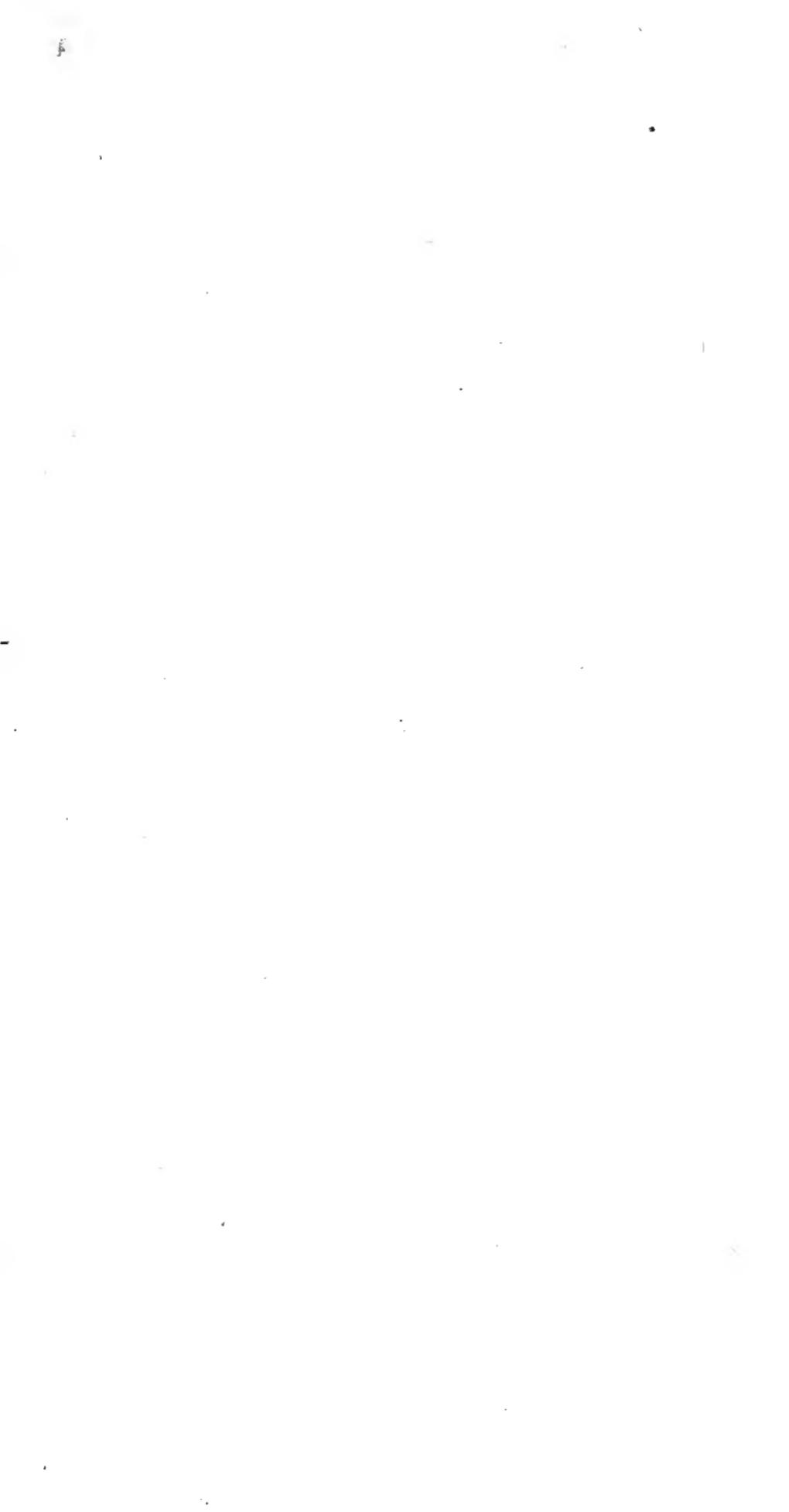


DATE DUE

UNIVERSITY LIBRARY

UNIVERSITY OF MASSACHUSETTS
AT
AMHERST

S
73
B32
1826
v. 9







THE
Massachusetts Agricultural

REPOSITORY and JOURNAL.

NUMBER I.....VOLUME IX.

CONTENTS.

Mr. Lowell's Report on Fat Cattle, Bulls and Bull Calves, with some prefatory remarks	1	On the Production of Silk and of Wine in the United States	42
Report of the Committee on all other Stock than Bulls and Fat Cattle	16	Domestic Manufacture of Silk and Brandy	45
Report of the Committee on the Ploughing Match of two yoke of Oxen	20	REVIEW.—An Encyclopædia of Gardening, comprising the Theory and Practice of Horticulture, Floriculture, Arboriculture, and Landscape-gardening, including all the latest improvements; a general history of gardening in all countries; &c. &c.	54
Report of the Committee on the Ploughing Match [with one yoke of Oxen]	21	The Silk Worm and its natural food the Mulberry	83
Report of the Committee on Inventions	23	Cattle Show, Exhibition of Manufactures, &c. at Brighton, Mass. on Wednesday and Thursday, the 18th and 19th of October, 1826.	94
Report of the Committee on Manufactures	25	Mr. Welles's Remarks	108
Report of the Committee on Agricultural Experiments	29		
Report of a Committee appointed to test the merits of the Working Cattle	31		
Agricultural Report	32		

BOSTON:

PUBLISHED BY WELLS AND LILLY, NO. 7, STATE-STREET,
FOR THE TRUSTEES OF THE MASSACHUSETTS SOCIETY FOR
PROMOTING AGRICULTURE.

Price 50 Cents.

1826.

630.06
V. 9 BOSTON,
STATE-STREET, FEB. 1826.

Wells and Lilly

INFORM their Friends and the Publick that they have taken Store No. 7, State-street, (south side,) four doors from the corner of Washington-street—their former residence being destroyed by fire.

(Orders promptly complied with—and Books imported to order as usual.

They have in Press:

THE WORKS OF THE RIGHT HON. EDMUND BURKE—complete. From the last London Edition.

ELEGANT EXTRACTS. A Copious Selection of Instructive, Moral, and Entertaining Passages, from the most Eminent Writers. In twelve volumes 18mo—six prose, six poetry.

A PRACTICAL TREATISE ON THE LAW OF EVIDENCE, and Digest of Proofs, in Civil and Criminal Proceedings. By THOMAS STARKIE, Esq. of the Inner Temple, Barrister at Law; Downing Professor of Common Law in the University of Cambridge. In 3 vols. royal 8vo. With Notes and References to American Decisions—By THERON METCALF.

A TREATISE ON THE LAW OF MORTGAGES, by the late JOHN JOSEPH POWELL, Esq. Barrister at Law. From the fifth London Edition—with copious Notes and an Appendix of Precedents, by THOMAS COVENTRY, Esq. of Lincoln's Inn.

(Notes and References to American Authorities will be added by an eminent Counsellor of the Massachusetts Bar.

A SYSTEM OF UNIVERSAL GEOGRAPHY. By M. MALTE-BRUN, Editor of the "Annales des Voyages," &c.

THE STUDY OF MEDICINE. Fourth American Edition. Reprinted from the last London Edition,—greatly improved and enlarged. By JOHN MASON GOOD, M.D. F.R.S. F.R.S.L. Mem. Am. Phil. Soc. and F.L. S. of Philadelphia. In Five Volumes.

THE

Massachusetts Agricultural,

REPOSITORY and JOURNAL.

NUMBER II.....VOLUME IX.

CONTENTS.

The raising of the Silk Worm, and the production of Silk, in Massachusetts	113	On the longevity, or duration of varieties of Fruits	148
On the change, or supposed change in the character of Fruits, by the farina of other varieties of the same Fruits, in the same year in which the intermix-ture is made	130	REVIEW.—Review of the third volume of the "Memoirs of the Board of Agriculture of the State of New York"	154
Some remarks on the destructive powers of the Rose Bug	143	Detached hints from the New York Agricultural Journal, with remarks	195
		On the effect of stirring the surface of the Earth, as a relief against drought	197

BOSTON:

PUBLISHED BY WELLS AND LILLY, NO. 91, COURT-STREET.

FOR THE TRUSTEES OF THE MASSACHUSETTS SOCIETY FOR
PROMOTING AGRICULTURE.

Price 50 Cents.

1826.

POCKET EDITION OF ELEGANT EXTRACTS.

WELLS & LILLY, (BOSTON,)

ARE PUBLISHING, BY SUBSCRIPTION, A NEAT POCKET EDITION OF

ELEGANT EXTRACTS.

Comprising a copious selection of Instructive, Moral, and Entertaining Passages, from the most eminent Prose Writers and Poets—in 12 volumes 18mo.—6 vols. in prose, and 6 in verse.

Those who send in their names and \$6, will have forwarded in such manner as directed, a complete sett of ELEGANT EXTRACTS, at the very low price of fifty cents per volume. It will be perceived, on reflection, that the work cannot be sold at so low a price, if expense is incurred in soliciting subscriptions, delivering the books, and collecting the money.

 The first volume is now ready—a volume will be published regularly every 1st and 15th of the month. Letters must be *post-paid*.

WELLS & LILLY are publishing BURKE'S Works, complete,—to be comprised in 7 or 8 volumes 8vo.—Subscribers to be furnished at the low price of \$2 per volume. The work will be elegantly printed on a beautiful paper, made entirely from linen. The two first volumes are now ready, and may be seen at the publishers' store, Court-street.

Agricultural Works,

FOR SALE BY WELLS AND LILLY.

STATISTICAL ILLUSTRATIONS.

Statistical Illustrations of the territorial extent and population—commerce, taxation, consumption, insolvency, pauperism, and crime, of the British Empire.

ENCYCLOPEDIA OF AGRICULTURE.

An Encyclopedia of Agriculture; comprising the theory and practice of the valuation, transfer, laying out, improvement, and management of landed property; and the cultivation and economy of the animal and vegetable productions of Agriculture, including all the latest Improvement; a general history of Agriculture in all countries; and a statistical view of its present state, with suggestions for its

future progress in the British Isles. By J. C. Loudon, Author of the Encyclopedia of Gardening. Illustrated with upwards of eight hundred engravings on wood. By Branston.

ENCYCLOPEDIA OF GARDENING.

An Encyclopedia of Gardening; comprising the theory and practice of horticulture, floriculture, landscape gardening, including all the latest improvements; a general history of gardening, in all countries, and a statistical view of its present state, with suggestions for its future progress, in the British Isles. By J. C. Loudon. Illustrated with many hundred engravings on wood. By Branston. Third Edition.

MASSACHUSETTS

AGRICULTURAL JOURNAL.

Vol. IX.]

JANUARY, 1826.

[No. I.

MR. LOWELL'S REPORT ON FAT CATTLE, BULLS AND BULL CALVES, WITH SOME PREFATORY REMARKS.

THE Committee of the Trustees of this Society appointed to make the arrangements of our annual festival, desirous of *economising* the time of the public, proposed some material and important changes with this view. Among the rest, they determined that it was inexpedient on the first day of the Cattle Show to have *any* ceremonies or *public address*. These were found to consume so much time, that it was almost impossible for the Committees to perform their duty with that ease and intelligence, which justice to the competitors seemed to require. No time sufficient for the purpose was left for deliberation, and the preparation of the Reports. By the suppression of the ceremonies and Address, they were enabled to make the trial of working cattle on the *first* day, which is a great convenience to competitors. It was hardly fair, and certainly not humane, to suffer the animals which had been employed in the Ploughing Match, to proceed *instantly* to the trial of their strength and skill in drawing heavy weights, and in the various movements necessary to form an opinion of their powers and training.

Another benefit was contemplated by the change. 'The
Vol. IX.

collection of such a concourse of people, and such a concurrence of fine animals, seemed to offer a fit occasion favourable to the seller and purchaser, for a Fair or auction of cattle and of other objects presented for show. Hitherto this sale being on the second day, not only obliged the owners of animals, and of goods intended to be sold, to remain at great expense to await the auction, but as the collection of persons who might be purchasers was much smaller on the second day than on the first, much, if not the greater part of the benefits proffered by this fair were lost. The animals and the goods were (it was feared) often sacrificed, and thus one of the objects contemplated was in a great degree frustrated.

We hope that the change will prove beneficial, though it can only be tested by experiment.

In conformity with the same views of economising time, the Committee proposed that the reading of the Reports of the several Committees should be dispensed with, and they publicly announced that the *list* of premiums *only* should be read, and the whole proceedings should be closed by an *extemporaneous* address from the President. To this last suggestion I have always felt an invincible repugnance. It is true that on most of the preceding anniversaries of the Brighton Show I have made some cursory and unprepared remarks, but I have since thought that the practice ought to be discontinued. If any remarks which an individual should or could suggest on such a public occasion, in which we are honoured by the attendance of farmers, manufacturers and other citizens, from all parts of the State, *could* be worthy of their attention, it surely would be more respectful as well as more useful, to devote some *little previous* thought, to make them so. I agree that they should not be elaborate,—that they should be familiar, simple, easy, natural. They should partake of the character of oral or *extemporaneous* communications. They should not be such as ought to be the fair subjects of criticism.

except with respect to the *thoughts*; those must and ought to be subject to strict examination. There are unquestionably some highly gifted minds, whose *first thoughts* are so *sound*, and whose mode of expressing them extemporaneously is so happy, that no painful feelings are excited from the hesitation or confusion of the speaker. But it seems to me that the topics of agriculture and manufactures do not afford scope for any display of eloquence, and that any effort to bestow ornament upon them is much worse than lost. To speak fluently and persuasively on *any* subject, we must be *excited in some degree above our natural and ordinary tone of feeling*. We can be so excited as to great *moral* and *religious* truths. We can be so excited at the bar, when the lives, fortunes, and reputation of our fellow men are at stake. We can *scarcely fail* to be so *excited*, when in legislative assemblies we are discussing the great interests of a state or nation: but how is it possible to raise our feelings to the lowest strain of eloquence, when we are descanting upon the comparative merits of various races of cattle, or different modes of culture of the soil?

It seems to me impossible.—But if it were possible to *others*, it is not to the individual, who now addresses you, who feels, that he never possessed that power, *that rare and almost supernatural gift*, sometimes *dangerous in its exercise*, of influencing the opinions of others by *original thoughts*, rapidly expressed in *glowing and kindling language*.

The great object of this, and of all the other almost innumerable societies throughout Europe and America (and their influence now extends to nearly 100 millions of people) is to encourage improvements in agriculture, and the mechanic arts closely connected with it, particularly domestic productions in private families—not that we feel indifferent to the success of those extensive and splendid *joint stock* companies, which by underselling the productions of foreign countries open a wide field for the encouragement of our industry, yet our *peculiar* province is to encourage

the promotion of improved modes of culture, to enable these old and highly populous states to retain their excellent, well educated population at *home*, rather than to force them abroad to acquire a precarious support in new countries, at the sacrifice of health, and in some cases of subsistence. Such are the legitimate, wise, and reasonable objects of all our agricultural associations in New England. We know very well from the example of Great Britain, that New England alone is capable of sustaining a population of 16 millions instead of two. We are convinced, that by remaining at *home*, much more and greater personal comfort will be secured to the individual—much greater opportunities afforded for literary, moral and religious instruction. It is therefore our first duty by all the means in our power to render our section of the country a desirable place of residence to our population. Nobody has a right to *quarrel* with us for attempting to make that population happy and prosperous, and for affording them inducements to stay at home. When we *emigrate*, they sometimes laugh at us for our sharpness, and shrewdness, the necessary result of our superior modes of *early* education. Surely they who so complain, will find no fault, if by improving our farms, by increasing the amount of purely domestic productions, and by availing ourselves of the advantages which God the author of all good has purposely given us, of our excellent *mill* privileges, we attempt to check the emigration of our citizens towards other states, where their *superior sagacity* is deemed *cunning*, and their *superior industry* is sometimes branded with the opprobrious name of *avarice* and *over-reaching*.

It is, it appears to me, time that New England should take care of itself, instead of permitting its territory to be depopulated by emigration. It is by the fair and active use of the proper means to accomplish this most desirable end, that New England, if it shall persevere in the present energy and intensity of its exertions, will bear to the other

portions of the United States in fifty years, a proportion far greater than it has hitherto borne.

It is pertinent in this view for us to consider what have been the moral and political means, which have raised Great Britain to its present high state of productive industry. I cannot give you a better nor a more condensed view of that state (I might almost call it a miraculous change) than by a very short notice introduced into the *Edinburgh Observer*, and copied into that excellent work, the *American Farmer*, edited by a man of strong powers of mind, John S. Skinner, Esq.

"In seventy years the people of Great Britain have advanced full eight millions in number.—Fifty years ago the very existence of canals was matter of incredulity, (recollect that this was so late as the commencement of the war with her colonies here, and that she has been engaged in 30 years of expensive warfare since that period) sixty-six millions of dollars have since been expended on canals, and at least half as much more are now devoted to new unfinished projects of this description. Fifty years since there was scarcely a steam engine in the country—there cannot be now less than 12000—a creation of power at least equal to the labour of 250,000 horses, an energy which in a single day would have erected the greatest pyramid of Egypt, heretofore the astonishment of mankind.—Fifty years since the export of manufactured cotton did not amount to a million of dollars, it has now swollen to 133 millions of dollars. In the same period the exported manufactures of woollen goods, in defiance of Saxon, Prussian, Spanish, and American competition have advanced more than eight millions of dollars.—Fifty years since the imports into England of new silk were only 250,000 pounds in weight, they are now nearly 30 millions.—Fifty years since they exported only four millions of yards of linen goods, they now export forty millions.—Fifty years since their whole exports were only 66 millions of dollars, they are now 222 millions."

Our own history would show perhaps as great and honourable a change, but it is still *vastly inferior to theirs*, in proportion to our *comparative population*. Our exports of domestic productions not exceeding 55 millions, and theirs being 222 millions; ours being to theirs only as $\frac{1}{4}$; while our *population is to theirs* as 11 to 16 or $\frac{2}{3}$.

It is important to us, and to all nations, to know from what cause, this rapid increase of British industry has been derived: no doubt from superior capital in the *first place*; from the employment of the lights of science in the *second*, but among the other causes, must be reckoned as not unimportant the encouragement given to individual skill and talent by their grand national society of arts and manufactures. That society has sedulously watched over the general interests; it has fostered every new invention; it has brought into public notice the retiring and modest inventor; it has recommended his discovery and has rewarded his skill not merely by its pecuniary aid, but by attracting public attention to *his merits*.

The same effect has been produced upon agriculture by similar measures. It is perfectly idle to attribute simply to *increased demand*, the rapid process, which that nation has made in the productions of its soil. It is of very little importance whether it is or is not admitted that *science* has done *much* for agriculture (though I believe it has effected more than is generally believed) but the attention to it, the exertions of those who have promoted it, not *for profit*, but from *patriotic and public motives*, have done incomparable good. It would be as absurd to deny, that the human intellect cannot when applied to agriculture effect important and valuable improvements, as it would be to contend, that it could not improve the *other arts*. Agriculture, to be sure, is not as susceptible of improvements by machinery, as its sister arts, but the range of its *objects of cultivation* may be indefinitely extended, and improvements may be made in the culture of *these new objects*. It is not generally known.

that the cabbage, and the carrot, and the Swedish turnip, and the beet and the most valuable varieties of the latter, the mangel wurtzel, and the yellow, and sugar beet, are altogether of modern introduction, so modern that our excellent ancestors had never heard of them—could not have heard of them because they did not exist.

I will not detain you on the subject of *fruits*, because it has, at present, but a limited interest. I am however much amused, when I hear one of our farmers who supply the Boston market with fruit, undervalue the services of the *gentlemen* farmers, when it is demonstrable that to their exertions they owe many of the good fruits, which they possess, and while they carefully watch *their* progress, and avail themselves of *all their improvements in the culture of them*.—This is perfectly natural, but it is highly proper that on public occasions, we should advert to the undoubted benefits, which science and superior capital has introduced.

Is there one farmer among those, whom I have the honour to address, who knows that clover is one of the trophies of agricultural science? that it was *utterly unknown* in England at the time of the emigration of our ancestors? I hope there are none, who are so ignorant as to believe that, the potato was a *native* production, or that it cost vast and continued efforts to overcome the prejudice of the farmers against it. Yet banish the potato, the result of commerce and science, and you would at once deprive Massachusetts of a plant, worth some millions of dollars annually, and if Ireland should be deprived of it, a famine would instantly ensue.

Shall we allude to the cotton plant? No—Our northern farmers *feel not* its importance *except indirectly* in the cheapness of the excellent cloth manufactured from it, in the general increase of wealth from its manufacture, in the building up of new towns in the interior, forming new and valuable markets for their products at enhanced prices, and with less labour and expense of transportation.

Yet you owe the *Cotton Plant* exclusively and entirely to intelligent men,—*book men*.—who were not practical farmers;—a plant which yields to this country a greater revenue than all its other productions of the sea and of the land.

We now come to some of the direct and undisputed benefits derived from this *particular society*.—Col. Humphreys introduced some Merino sheep. His situation as minister to the Court of Portugal enabled him, and he wisely and patriotically availed himself of the opportunity to introduce a few Merino sheep. This society, alive to the interests of agriculture, granted him their gold medal. It was not so much to him, the value of the present, as the evidence it afforded of the importance of the acquisition, thus enabling him to put a high price on his sheep. Col. Humphreys kept his sheep,—as he had a right to do—for his own *private emolument*. A few years afterwards Mr. Livingston, our minister to France, had credit enough with the Emperor to obtain some of the Merino race from the imperial flock of Rambouillet. He, too, as he had a *right to do*, turned his importation to profit, and the price of 3000 dollars for a single ram excited the attention of our Society, and, knowing, as we did, that they could be bought in Spain for 10 dollars, of the purest breed, we offered premiums of 100 dollars *each for rams and ewes*. They came in great numbers as we anticipated. There was a foolish rage in the *first instance*, perfectly absurd in itself, but always inevitable in such cases. It ended, just like the late absurd speculations in cotton, in disappointment and disaster, and the Merinos fell into a disrepute as irrational as had been the extravagant rise. But time and good sense, and experience, those sound counsellors which never deceive us, but which always settle human affairs on their true and solid foundation, soon raised the Merinos to their merited rank, and it may be now safely asserted, that never did any society more wisely and judiciously expend its money for the benefit of any country, than ours has done by granting a

medal to Col. Humphreys in the first instance, and finding that he and Mr. Livingston adopted the very fair and justifiable project of a *monopoly*, and a very *restricted* one, by offering premiums for *new importations* which it can be *proved* by our records induced the importation of many thousands.—Let us then enjoy a due credit for our exertions. We ask *no more*. It is a curious fact, worthy of notice in the history of agriculture, (and commerce and manufactures can exhibit many as curious) that the Merino sheep became in this country at one time so odious, so much of a *bye-word*, that those who had adventured in the speculations, were compelled to join in the *general laugh* at them, and to shelter themselves under the ground of an *epidemic illusion*.

Yet in the short space of seven years, we have not only seen the Merino races rise into favour, but we have seen sheep of that breed introduced from the cold and comfortless region of Saxony, and selling at prices which, it is alleged, have afforded the importers a profit of 12, or 15,000 dollars on a very few sheep. We ought not, however, to disguise or conceal the fact, that much of this extravagant demand has been the result of a system of *protecting* duties, which, whatever effect the eloquence of interested raisers of sheep may produce on public opinion and policy, is radically unsound.

Fifty years hence men will be, if not *astonished*, at least ashamed, that the science of political economy was so little understood in our country. They will be surprised that we should be willing to pay so much for articles of the first necessity, merely to advance and increase the profits of one thousandth part of our community—that we should consent to pay for our clothing 35 per cent. more than we ought to pay, or than it is worth, the whole of which constitutes the profit of one hundredth or one thousandth part of our population. But we are as yet in our infancy; and it is not extraordinary that we should adopt the erroneous doctrines

prevalent in Europe *one hundred years since*, and in some parts of Europe even now. The concentration of effort and exertion of opulent, intelligent persons interested in any particular branch of industry, must for a long period of time be an overmatch for the enlightened but disinterested advocates for an ENTIRE FREEDOM OF TRADE and of HUMAN INDUSTRY. It must not be inferred that we think lightly of the value of manufacturing industry, nor of its effects on our prosperity ; but we would have its growth a natural one—healthy and vigorous—which, not depending on monopolising acts, will endure by its own native strength.—It will not be supposed that I am unfriendly to manufactures, in which the fortunes of those most dear to me, and a large portion of my own are engaged ; but I wish that they should repose on a basis, much more secure and durable than *legislative* provisions, *subject to repeal*, and tending to an unnatural and morbid extension of them, much more ruinous to *small* adventurers, than to the larger ones.

We will now advert to another branch of the efforts of this Society, *to improve the breed of domestic animals*. It is, we all know, debatable ground. We shall not enter into the controversy ; but we owe it to ourselves to defend the grounds on which we offered premiums for *imported* stock.

It was well known to every agricultural man, who was a reader, that Great Britain and France were not contented with the existing state of their horned cattle—that for fifty years last past they had set themselves seriously at work to *improve* them. It was as certainly true, that in *our* country *no such effort had been made*. Of course, it was to be *presumed* that these nations *had improved their races*, while ours had been, to say the least, stationary. It is admitted on *all* sides, that much may be done by selection of fine individuals, and by care in preserving the important races pure from contamination or intercourse with poorer ones. No such selection of our races has taken place to this hour, that I know of. It cannot be denied, that we in New Eng-

land have taken no pains whatever on this subject. If it should be admitted, that the fine natural pastures on the beautiful, fertile, and moist hills of Worcester, that paradise of New England for fine cattle, had kept up a race of cattle, vigorous, and nearly perfect in their forms, the same could not be affirmed of Bristol, or the southern counties, or of the northern part of Middlesex or Norfolk. In truth our race of *milch cows* was and is *generally* ordinary, and our *cattle at large* may be affirmed to be inferior to those of England,—of the Netherlands, and of Normandy. I can only say, that going to Europe with very little agricultural knowledge, I admit, in 1803, the first and deepest impression made on my mind of any differences in the agricultural state of those countries compared with our own, arose from the marked, the unquestionable superiority of their *horned* animals. Their proportions were better,—their size was generally superior—the bags of their cows were larger and better formed—the Show at Smithfield, a market like that of Brighton, exhibited finer animals for sale,—much finer,—on common market days, than Brighton, except rarely, *ever* exhibits. I speak of the *average* appearance, which is the only *fair* rule.

On my return I was struck with the difference, the inferior state of our cattle—the comparative amount of offal, when the animal was *fat*.

I should limit myself, as the first and principal advantage derived from foreign importation to this, that the care bestowed on the cross breed, is of itself a boon, equal to *all* the increased expense. We have been, we all know, utterly careless of our young stock. The introduction of a new breed produces of itself a greater degree of care. This is a good not easily estimated. The attention to *one* animal naturally leads to an increased attention to a promising one of *native* race, and so the whole mass are gradually improved. Is not this the way, the ordinary course, by

which all other improvements in human industry are produced?

If Mr. Slater had not introduced his cotton mill into Rhode Island some 30 years since, can any man say that there would have been at *this* day a cotton factory in New England? I do not mean to say that there might not—but I have no doubt that this establishment accelerated the introduction of them. The knowledge, that other nations possess superior modes of industry does not excite, or but *very slowly excites*, a disposition to copy the example. One successful effort at home does more in 3 years, than 50 years' success in another country. We are, it is true, imitative animals, but still we need to have the example before *our own eyes*. We apply these remarks which we believe to be sound, to agricultural improvements, and especially to the amelioration of our domestic animals. How long had we read of Saxony and Spanish sheep without ever *dreaming* of introducing them? Once introduced, they spread with a velocity which is astonishing. Grant, that the horned cattle imported are not in any respect superior to our own—(not that I believe it),—yet their introduction has given a value to all other stock of the same description, by inducing more care as to their treatment and improvement, and a general attention to the *subject*. If it *has not* produced this effect, it must be only because we are incorrigibly obstinate in persisting in *old* usages, in the neglect of selecting the finest individuals for breeding, and of sustaining and improving by generous food, those *which we do raise*.

It surely cannot be unimportant in a state, whose great staples must forever be, their beef, pork, and wool, to urge on *every* occasion, to press by *every* means, the amelioration of the races of the animals which yield us these staple productions. We may indeed fairly differ as to the *means best adapted to the end*, but as this must be a subject of some delicacy and difficulty, it would appear to us to be the

wisest and best course to give a free and unrestrained range to every sort of experiment, not the least important of which in my judgment, nay the *most important*, is to see, by actual trial, how far the European improvements in the breed of cattle, our staple production, are adapted to our culture.

If they *fail*, no lasting injury can be the consequence, because the opponents of imported stock contend, that the progress of change *is very slow*, and if *disadvantageous*, will of course be checked by individual interest, before any great evil should be effected. My own conviction is, that the experiment has been so far successful.

Having made these general remarks, which I am sensible have been extended to what, I fear, will be felt to be a tedious length, let us now advert to our present cattle show, and to those animals which fell under the particular and minute notice of the Committee of which I was chairman.

Such an exhibition of fat cattle has, so far as I know, never been seen at Brighton, and I believe in America. There were no less than thirteen animals, weighing from 1673 to 2319 pounds, and from 5 to 7 years of age. In every case but one, they had been inured to hard labour, and in every case, the *expense* of feed in fattening was *far less* than English writers give as the average course of fattening in England. *Operate as it may*, it is both *my duty and inclination* to state fairly and fully the results and the facts. The greater part of these animals had been taken off from labour about seven months. Their food had been generally what is called Cob Meal, that is the corn and cob of Indian corn ground together. Some interesting facts were stated by one farmer, which I deem it a duty to exhibit.

He tried his ox with pure Indian meal, and after a few days' trial, the animal refused it. He then tried the coarser food of Cob meal, which I have just defined, and he took to it greedily. This is a modern experiment, and may prove of great practical utility. A Shrewsbury farmer, I think by the name of Rice, was the first who communicated it to

our society, though it may have been in use *long before*. It is important however to know, that an animal may refuse a richer food and prefer a coarser one. I am not at all surprised at it. It is precisely in conformity with what we see every day around us. A sailor would pine on turkies and dung hill sowis as a constant food, and return with pleasure to his beef and pork, and peas soup.

There was another very interesting fact disclosed on this examination. There were three fine *five year old* steers of Joseph Easterbrooks, Esq. of Royalston, two of which had been worked hard from the age of 3 years, and the third had *never had a yoke around his neck*. The judges (and better judges there could scarcely be, than my associates) could perceive no sensible difference in the value of the worked and unworked cattle. Of the *same* age, owned by the *same* man, with the *same* treatment and *food* the unworked oxen were in no degree superior to those, which had been submitted to labour. Great Britain might learn a lesson from *this* example, if her farmers could have been present. It is also worthy of remark, that these five years old cattle weighed about a ton a-piece, and the *seven* years old cattle but a *trifle more*. I state these facts as being worthy of notice, since I deem one practical remark of far greater value than volumies of theory.

The Committee award the first premium for fat oxen to Joseph Easterbrooks, of Royalston, for his dark brown ox, weight 2104, 7 years old, 25 dollars.

The second premium for fat oxen, they award to John Temple for his silver nosed ox, 6 years old, weight 2178, 20 dollars.

The third premium to the same person, John Temple, for his other ox of the same yoke, 10 dollars.

I owe it to my colleagues, to whom I wholly deferred the decision in this case of fat cattle, to say, that their duty was one of peculiar difficulty and delicacy: The cattle were all so fine, so equal in their forms, proportions and

good qualities, that even such judges as Mr. *Winchester* and Mr. *Baker*, my associates, must have been, and they were embarrassed.

On this subject, I will take occasion to say, that our cattle are in fact heavier and larger in *my opinion* than the English cattle, taking them *on an average in both cases*.

The great distinction, which I should make from the experience of 6 years, at our cattle shows, would be this, that the *crosses* of the *imported stock* have *less offal, less unprofitable meat*, keep fat with *less food*, or rather keep *more fat* on the *same food* than our own races.

I know very well, that this opinion is questioned by very high authority, but my opportunities have not been few, serving for so many years on this committee, and I am constrained to say, and it is *my duty* to say it, as I *believe it*, that upon precisely the same food the improved races of Great Britain (as we see them *here*) not only have more profitable flesh, on parts of great value, but they will thrive faster on the same food than our native stock. Exceptions of course, every man of sense knows occur in all breeds; I know personally, that an animal, taken from its mother at a *week old*, treated *precisely as native stock* by its side was treated, has been *always fat*, while the others were lean. I touch not the question, for it is *but conjecture* whether, with our inferior and often careless treatment, they will not *degenerate*. *If they do*, and only *when they do*, we ought to consider them *no longer objects of attention*.

The competition for bulls we are sorry to say was this year smaller than we have ever known. We award

The first premium to Zephaniah Brown, of Charlton, for a bull out of Holderness, an imported animal, 30 dollars.

The second to William Gilmore, of Franklin, Norfolk county, to his bull also out of Holderness, 20 dollars.

The third to Hon. John Welles, for his bull of the Cœlebs race, 10 dollars.

The bull calves were also few in number, much less than usual, and we regret it.

The first premium we award to the Hon. Mr. Welles, for a bull calf from Admiral, 4 Denton, 15 dollars.

The second to Jeremiah Hawes, of East Sudbury, for a bull calf of *native* breed, 10 dollars.

The third to Henry Craft for a bull out of Mr. George Lyman's beautiful imported bull, 5 dollars.

No. 2.

*The Committee on all other Stock than Bulls and Fat Cattle—
Consisting of Mess. J. Welles, Luke Fiske, and Thomas Williams—*

~~REPORT~~, that they have seen with pleasure the general improvement of the Stock which has been successively of late exhibited at the Brighton Cattle Show. This has been the result of an increasing ardour in competition, honourable to those who act under its influence, and most beneficial to the community. If, (as might well be the case) many more of our good stock, with our household and other manufactures, were exhibited, an increasing interest might be given to this holiday, adding still more to its influence and utility. Enough, however, has been already shown, to convince those who look to these great sources of our national prosperity, that they will not be neglected by an intelligent people.

In the examination of Stock, the Committee began with Milch Cows, and after a careful comparison, were induced to award the *first premium* of \$30 to *George H. Hardy* of Waltham. This Cow did not exceed the middle size,—was of native stock, 7 years old,—and for some months after calving, gave about 18 quarts of milk. For nearly 4 months she averaged 11½ lbs. of butter a week. In July last she gave 46 pounds of milk; she now affords 32 pounds, and holds out over 3 quarts of milk to nearly the time of calving.

The Committee award the *second premium* of \$20 to the *Rev. John White*, of Dedham. This Cow was of native stock and of middle size, and gave 12 pounds of butter for six weeks in succession. In one week 12 pounds 13 ounces was made from her milk. For 3 months she averaged 10 $\frac{1}{4}$ pounds of butter; in the best of the season over 18 quarts of milk. These cows were so alike and both excellent, that the Committee might well feel at a loss. The former was preferred, from holding out her milk for a rather longer period, and some other slight causes.

The Committee award the *third premium* of \$15 to *Nathan Pierce* of Salem. This cow was of great product in milk, and had given by statement 3528 quarts of milk in a year, being an average of nearly 10 quarts a day. Her milk appeared rich, and well suited for the dairy, certificates of which were furnished from several who had used of it. But it was not sufficiently shown how far she was of value in this particular, which is most essential.

There were some other cows of great product, which might have competed, or been preferred even to those to whom the premiums have been awarded. But the representations offered, on which a judgment was to be formed, were too general. They were sufficient, however, to induce your Committee to infer that they probably were very superior animals.—There were several other milch cows offered for premium, some with calves in high order at their sides. But in these cases, though adding to the interest of the Show, your Committee found in many respects a want of those circumstances and of that precision which would be requisite in order to make them proper subjects of consideration. The cow exhibited by the *Rev. Dr. Foster*, of Brighton, called *Flora*, was a very fine one, giving nearly 18 quarts a day of rich milk.—The pens contained several other fine cows for exhibition only.

Of the Heifers in Milk, your Committee were of opinion that the first premium of \$15 should be awarded to *Ebene-*

zer Niles, of Boston, for a very fine heifer of the hornless or Galloway breed, the sire Cœlebs. This animal would have received, we are authorized to say, the first premium last year for heifers, but she was by mistake inserted for exhibition only. Her excellence now is better established.

The second premium of \$10 for heifers in milk the Committee award to Josiah Seaverns, of Roxbury, for his heifer from a native cow. Her sire the imported Alderney bull, given to the Society by John Hubbard, Esq. now in the possession of Mr. Parsons.

These heifers were of strong promise.

The premiums for heifers the Committee award as follows :

To Benjamin Harrington, of Princeton, for his heifer 18 months old, the first premium of \$12.—The dam native, the sire Holderness.

To Wm. H. Prentice, of Boston, for his twins about 18 months old, from a fine native cow, \$10—the sire Cœlebs. The second for his red heifer, \$10. The third for his red roan heifer, \$8.

To John Prince, Esq. for his heifer from Denton, about 18 months old. The cow native—the 4th premium, \$6.

The Committee, before they pass to other stock, may be indulged in the remark, that to those who favour the improvement of our own native stock upon a well governed selection from them only, the exhibition this day of milch cows must have been gratifying.

On the other hand, the heifers in milk and the other young stock afford room for the most ardent anticipation of great and increasing improvements from the imported stocks. Much is doubtless to be effected in both modes. The able and interesting discussion before the public on this subject cannot but awaken and excite to more multiplied courses of experience, and thus lead us to more satisfactory and certain results.

As to sheep, your committee made as careful an exami-

nation of the Merinos from Saxony and elsewhere, as was in their power; and they award

The 1st premium for a merino ram of the Saxony breed to Joseph Barrett, of Concord, \$15.

The second premium to the same gentleman for his merino ram \$10.

For a flock of merino ewes, the first premium to the said Joseph Barrett \$20.

The 2d premium for do. to George M. Barrett, of Concord, \$10.

There was exhibited a fine specimen of long woolled sheep by Major Jaques.

Mr. Shepherd of Northampton also exhibited a beautiful pair of twin lambs, male and female, of the improved Leicestershire breed. As these were not imported, but brought from a neighbouring state, and there bred, your Committee were reluctantly compelled to consider them as not entitled to premiums.

Of Swine, the exhibition was of a very improved character. The pens were crowded with them. A breed of hogs with small bones and subject to little waste, quiet and disposed to fatten, and yet of great weight, were found to have taken place of the long, lank, coarse, greedy and insatiable animal, with which our country has been infested.

The Committee award for the best boar to Silas Dudley, of Sutton,

The 1st premium \$12.

The 2d do. to George M. Robbins \$8.

The 3d do. to John Parkman of Brighton \$5.

The Committee award

For the best sow to Capt. John Mackay \$12.

For the next best to Silas Dudley, of Sutton, \$8.

To Moses Bright, of Watertown, the 3d do. \$5.

For the best store pigs to Capt. John Mackay, of Weston, the 1st premium \$10.

The 2d to Jonas Cutter, of Weston, \$5.

Of the stock presented for exhibition the Committee noticed a beautiful cow of the Hon. William Gray.

There were several heifers of Mr. Parsons full and part blooded, which were deservedly admired.

Of animals not strictly within the authority of the Committee, they will be excused for noticing as adding to the show:—The beautiful *mare* and horse colt, generously presented to the Society by Admiral Sir Isaac Coffin.

A blood mare, with a mule by her side, was exhibited by S. W. Pomeroy, Esq.

A fine mare colt was also exhibited by Major Talbot, of Dedham.

The Committee were gratified to perceive a general improvement in the stock offered for inspection at the Brighton Cattle Show; and they think the community has much to expect from efforts so well guided.

All of which is submitted.

Per order. JOHN WELLES, Chairman.

No. 3.

*The Committee on the Ploughing Match of two yoke of oxen,—
consisting of John Prince, Nathan Adams, of Medford, and
Daniel Adams 3d. of Newbury—*

REPORT—that six teams only appeared to contend—(eleven having previously retired)—viz.

1. Silas Dudley, of Sutton—plough made by Warren, of Dedham—work done in 31 minutes.

2. Samuel Sibley, of Sutton, plough by Hall Sutton—work done in 35 minutes 30 seconds.

3. Sherman Barrett, of Concord, plough of cast iron by Tice—work done in 35 minutes.

4. Joseph Curtis, of Roxbury, plough by Warren of Dedham—work done in 35 minutes.

5. Aaron D. Williams, Roxbury, plough by Warren of Dedham—work done in 39 minutes.

6. Stedman Williams, Roxbury, plough by Warren, of Dedham—work done in 33 minutes.

The lots were exactly one-eighth of an acre—the land

only two years since laid down, and very thin sward, that the Committee apprehended handsome work could not be effected—they are gratified however in stating that by the skill of the ploughmen and drivers, and the great docility of the cattle, the work was extremely well performed.

They were very particular in directing that the cattle should not be hurried, and forty minutes were allowed for the task. They have been unanimous in deciding the premiums, and hope the unsuccessful competitors will not be deterred from trying another season.

They award the first premium

To Sherman Barrett, of Concord	\$15
Himself as ploughman	3
Prescott Barrett, driver	4
	—\$27
2d. To Aaron Davis Williams	10
Ebenezer Lord, ploughman	5
David How, Driver	3
	—18
3d. To Samuel Sibley, of Sutton	6
do. as ploughman	3
Benjamin Woodbury, driver	2
	—11

It is wished by the Committee to remark that the first premium was gained by a *cast iron* plough—taking into consideration the great saving in *repairs* for a length of time, they cannot but take pleasure in recommending cast iron ploughs to their agricultural brothers.

(Signed by) JOHN PRINCE,

NATHAN ADAMS,

DANIEL ADAMS, 3d.

Brighton, 20th October, 1825.

*The Committee on the Ploughing Match [with one yoke of Oxen,]
consisting of E. Hersy Derby, Chairman, Col. Josiah Titcomb,
and Ebenezer Heath, Esq.*

REPORT, The conditions of the match were, that the lots

should be one-eighth of an acre each, and the ploughmen arranged according to the date of their entry.

The ploughing was to be five inches deep, and the furrow slice to be not more than ten inches wide.

The excellency of the work, and economy of labour, and not the rapidity, was to be the criterion in awarding the premium, regard being also had to the state in which the cattle came from their work, and to their general appearance.

40 minutes were allowed for the performance of the task.

There were nine competitors started, all with a driver except two.

The first lot was finished in 24 minutes, and the last in 35 do.

It gave the Committee great pleasure to observe the excellency of the teams, and the good order, and superior management of the ploughmen and drivers.

The ploughs were all good, two of them cast iron, the others of wood.

With great satisfaction the Committee state, that, considering the unsuitableness of the ground for an exhibition of this kind, there being a number of large rocks in the lots, and the same being badly swarded, they have never at any of our shows, seen so much good work. All of it being so excellent, they have found it extremely difficult to decide to whom they should award the premiums.

After a great deal of consultation they have decided to award to Abiel H. Wheeler, of Concord, the first premium of fifteen dollars; to the ploughman, eight dollars, and to the driver, four dollars.

To Perley Tapley, of Danvers, the second premium of ten dollars, to the same as ploughman, five dollars, and to the same as driver, having no other driver, three dollars.

To Seth Hastings, of Mendon, the third premium of six

dollars, to the ploughman, three dollars, to the same as driver, having no other driver, two dollars.

E. HERSY DERBY,
JOSIAH TITCOMB,
EBENEZER HEATH.

Brighton, 20th October, 1825.

No. 4.

The Committee on Inventions—

REPORT—that the entries under this head were uncommonly few.

Two yokes were offered for premium, the one by Leonard Dodge, of Sutton, the other by Moses Bellows, of Shrewsbury. Both of fine workmanship, and very creditable to the mechanics who made them, but, as far as the Committee could perceive, neither possessed qualities so different from other yokes as entitled them to any premium as inventions; and no persons were in attendance to explain the peculiar advantages resulting from the particular difference perceptible between these and common yokes.

A plough was also entered for premium by Mr. Stephen R. Phelps, of Marlborough. This plough appears to be a patented invention, originally made in New Jersey. The great peculiarity of this plough consists in making the nose or point of the plough independent of the share, and connecting it with a bar of steel, which can be moved forward by means of screws, as the nose or point wears, and being inverted causes the action of the plough to counteract the effect of the wearing, and hence keep itself in working order better than the ordinary ploughs.—From this circumstance, this plough is denominated the self-sharpening plough; and the Committee think that the invention, if it have the effect asserted, and which from its construction seems likely to be the case, must be an improvement of that important implement of agriculture.

Your Committee, however, had no evidence of the im-

struments having been used and approved by practical farmers; and therefore do not deem it within their authority to grant a premium.

Mr. J. P. Miriam, of Concord, also presented for premium a hassock cutter and plough cutter.

Both of them your committee cannot doubt to be useful in the particular soils for which they are constructed. But no certificates of use and approbation by practical farmers attended either, and besides, neither instrument seemed very materially to differ from a species of instrument not uncommon in England, and which have been used in this country. At least the difference was not such as to entitle either of them to a premium under the head of inventions.

Robert S. Babcock, of Roxbury, presented for premium several hay forks, of a very excellent and improved quality, and form, and, in the opinion of your Committee highly worthy of patronage by intelligent agriculturists. They are of steel, of an excellent quality. The tines round, and in their shape and bend, and balancing on their handles superior to any hay forks your Committee have seen. They are connected with their handles by a long ferule, and inserted into them with great strength and security.

One great advantage they possess over the common patented steel fork, is that they are more easily repaired, if broken; whereas the former so far as we have had experience or been informed, when broken are in general considered as lost.

John Prince, Esq. of Jamaica plains, who has used these forks for two or three years, expressed his entire acquiescence in all the above particulars, considering one of them worth any two forks of any other description he had ever owned.

Considering the importance of this instrument, and the excellence of the improvement, your Committee award a premium to Mr. Babcock of ten dollars.

Mr. Pepe's threshing machine, which on a former occa-

sion received a premium, was presented for exhibition, accompanied by certificates of its success and usefulness, which were both gratifying and encouraging.

A very curious machine for the purpose of making mortices, was presented for exhibition by ————— which your Committee can have no question will be a very useful instrument, though it does not come within the sphere of the society's premiums.

Messrs. Haliday & Ewing, of Boston, presented for exhibition blocks for printing calicoes, of an excellent workmanship; and executed in a style which cannot fail to do them great credit, and to ensure them encouragement in those important manufactures towards which their ingenuity is directed.

All which is respectfully submitted by

JOSIAH QUINCY.

October 19, 1825.

No. 5.

*The Committee on Manufactures, consisting of R. Sullivan,
Samuel Appleton, George Searle, and John W. Boott—*

ADJUDGE, for Broadcloth—

To Messrs. Slater and Howard, of Dudley, 1st prem. \$20

To the Walcott Wollen Manu. Comp. 2d prem. 15

For Cassimere,

To Messrs. Slater & Howard, the 1st premium 12

For Woollen Cloth and Household Manufacture,

To Nathan Barrett, jr. of Concord, the 1st premium 12

To Ephraim Fuller, of Lancaster, the 2d premium 8

For Flannel,

To Mrs. Noah Strong of Norwich, the 2d premium 7

For Carpeting,

To Eliza Warren, of New Braintree, the 1st premium 15

To Sybil Wilcox, of New Braintree, the 2d premium 7

For Stair Carpeting,

To G. Delano of New Braintree, the 1st premium 10

For Blankets,	
To Betsey Delano, of New Braintree, the 1st premium	6
To Mrs. John Hunter, of New Braintree, 2d premium	4
For Diaper,	
To Eliza Warren, of New Braintree, the 2d premium	5
For Linen Sheetings,	
To the Mrs. Leonards, of Sturbridge, 1st prem.	3
To Sarah Wilcox, of New Braintree, 2d prem.	4
For Sewing Silk,	
To Emily Fitch, of Hopkinton, the 1st premium	5
The committee award a gratuity to,	
Mary Simonds, of Dorchester, for a bed quilt	3
Lucy H. Brooks, of Lincoln, for a counterpane	3
Sarah A. Hughton, of Brighton, for a patch quilt	2
Mrs. Gleason, of New Braintree, for large coverlets	3
Mary B. Temple, of West Boylston, for a counterpane	2
Miss C. Paige, of Newburyport, for a counterpane	3
Mrs. Davis, of Boston, for a rug	2
Sylvia Harding, of Boston—Jane Coburn, of Dracut—	
Susan Thayer, of Natick—Mary Newell, of Watertown—Eliza Williams, of Deerfield—and Mrs. S.	
Bott, of Salem, for hearth rugs of good quality, each	1
Hannah Eaton, of Dedham, for a man's hat made of	
the palm leaf, more durable than the common straw	
hat	2
Jane Riley, of Boston, for fine linen thread	1
Elizabeth Hapgood for straw hats of rye straw and	
hat from spear grass	3
Nancy Goodwin, of Middleborough, for a grass bonnet	
and netting fringe	1
W. Davenport, of Concord, for various and beautiful	
samples of silk buttons	4
Sally Howe, of Marlboro', for a specimen of bags	
woven without seam in a common loom	2
Abigail Kilburn, of Lunenburgh, for a very fine straw	
bonnet	3
Elizabeth W. Childs, aged 12 years, for a lace veil	1

Columbian Manufacturing Company for a specimen of straw bonnets of fine quality 3

Abigail Sadler, of Hopkinton, for a fine straw bonnet 3

Beautiful specimens of fine needle work were noticed by the Committee.

A veil and cape by the Misses Rider, of Boston.

Lace veils by Abby Harris, of Boston.

Lace veils by Maria D. Moore, of Newton.

A lace veil by Lucy Ann Howe, of Hopkinton.

Fancy Baskets by Catherine Flagg, and Mrs. P. E. Converse, of Woburn.

An imitation India dress by Miss J. G. Smith, of Boston.

A thread lace veil by Evelina Penniman, of Boston.

Specimen of knit work by Miss M. Starbuck, of Nantucket.

A lace veil by Miss S. S. Baxter, of Boston.

A lace veil by Sarah B. Steadman, of Boston.

A specimen of work by Sarah S. Savage, of Lancaster.

Lace veils, lace and fine work by Lucy Cotting—Dorcas C. Fay—Merian S. Hayden—Maria S. Rogers—Merian L. Rogers—Hester Billings—and Hannah M. Johnson, all of Boston.

The object of giving gratuities in money being to encourage manufactures of more general utility, as well as to reward ingenuity and household industry, the Committee fulfil their duty in mentioning the names of ladies who have embellished the exhibition with ornamental works of taste.

Three pairs of shoes presented by Cushman Bassett, of Boston, were of first rate workmanship.

A beautiful specimen of sewing silk, with a reel of raw silk, were exhibited by Mrs. Harris, of Dorchester.

Mrs. George Adams, of Newbury, presented a piece of worsted plaid, made from the wool of the long wool Netherlands sheep, given to the Society by Thomas H. Perkins, Esq. It was considered a good imitation of Scotch plaid, and a new manufacture in this country.

The exhibition was enriched by samples of foolscap and

letter paper of excellent quality, presented by Mr. Andrew J. Allen, and by T. G. Fessenden, Esq. from the mill of Holbrook & Fessenden, Brattleboro', Vt.

Four pieces of flannel were sent by the Amesbury Flannel Manufacturing Company—white and coloured. The Committee did not hesitate to pronounce them equal in all respects to the best English flannels. The Committee were informed that a discovery has been made recently at this Factory, by which the red colour from madder is freed from the yellow tinge common in red flannels.

Seven pieces of printed silk handkerchiefs were handsome specimens of printing, and the colours brilliant and in good taste.

A piece of undressed flannel was presented by Moses Learned, of Palmer, with samples of the wool of his flock. The flannel being in an unfinished state, the Committee could not consider it an object of premium. The thread was very fine and the fabric good. Mr. Learned has practised clothing his sheep three years.—A cloth of cotton or coarse canvass is put on immediately after shearing, and kept on until the next shearing. The last season he blancketed, as he terms it, 175 sheep. He believes that the animal thrives better for this protection, and that the advantage from keeping the wool in a cleaner state, and having the pile soft and good to the extremities, more than pays the expense of 16 cents per head,—the estimated cost of the clothing.

Samples of writing and drawing pencils were offered by Messrs. Melvin & Blood, of Concord, accompanied by certificates stating that these pencils have the essential qualities of a good article, being both tough and soft, and are durable when cut to a long and slender point.

The Roxbury Colour and Paint Manufacturing Company, presented by Joseph R. Newell, their Agent, several samples of brilliant colours. of their manufacture. Their

establishment is the first of the kind within the state, and is said to meet with the most encouraging success.

RICHARD SULLIVAN,
SAMUEL APPLETON,
GEORGE SEARLE,
JOHN W. BOOTT.

No. 6.

The Committee on Agricultural Experiments, to whom was also committed the inspection of sunary articles of Manufacture, for which premiums were offered,

REPORT, That seven parcels of cheese, of more than one year old, and nineteen parcels of new cheese, were offered for the Society's premiums ; with the exception of one parcel of old and one parcel of new cheese, all of it was from the town of New Braintree, in the county of Worcester. The new cheese is superior in flavor and richness, to that offered the last year. Of the old cheese, that from the dairy of Mr. Benjamin C. Perkins, of Becket, in the county of Berkshire, was considered by your Committee to be the best ; and they award to him the premium of ten dollars. Your Committee could not, on thorough examination, find any parcel of old cheese which in their judgment was sufficiently good to be entitled to the second premium ; they are aware that great care and attention is required to preserve cheese for any considerable length of time uninjured in its flavour ; and they are not unmindful that the past season, from the extreme heat of the weather, has been unfavorable to the preservation of cheese ; still they are of the opinion that the interest of the farmer would be greatly subserved by having a proper deposite for his cheese, in which the temperature of the air should vary as little as possible through the year.

Eleven parcels of butter were entered for premium, none of it such as your Committee deemed to be of the very first quality ; some of it being too highly charged with salt.

and from several of the parcels the buttermilk was not sufficiently expressed; that from the dairy of the Rev. Lemuel Capen, of South Boston, was considered to be the best; and your Committee recommend that the premium of fifteen dollars be paid to him; the premium of ten dollars, to Mr. Michael Crosby, of Bedford, in the county of Middlesex, for the next best; the premium of seven dollars, to Mr. Luther Chamberlain, of Westborough, in the county of Worcester, for the next best; and the premium of five dollars to Mr. Jacob Dean, of Mansfield, in the county of Bristol, for the next best.

Ten samples of currant wine were entered for premium, most of it superior to any offered the last season; and with two or three years' additional age, would fall little short of the best light wines of Europe; the red wine made by John Prince, Esq. of Roxbury, was considered to be the best; and is entitled to the premium of ten dollars; the white wine made by Mr. Kenrick, of Newton, the next best; and is entitled to the premium of five dollars.

Four barrels of cider were entered for premium; none of which was deemed to be of the first quality; that made by Col. Daniel Leland, of Sherburne, in the county of Middlesex, was adjudged to be the best; and is entitled to the Society's second premium, being \$10. Your Committee cannot refrain from offering it as their opinion, that little or no improvement has for several years past taken place in the making of cider; a liquor the use of which would be much increased, was more attention observed in manufacturing it; in such case it would without doubt be, to a very considerable extent, substituted for ardent spirits; the great consumption of which in this country, is exceedingly to be deprecated—sufficient attention is seldom paid to cleansing the casks into which the cider is to be put.

Several hives of honey were entered for premium; that offered by Mr. Ebenezer Fitch, of Sterling, in the county of Worcester, was not considered to be of the very first

quality; but having proved to the satisfaction of your Committee, that he had taken up the present season on his own farm, 266 pounds of honey, they recommend that the premium of \$10 be paid to him. Mr. Ebenezer Withington, of Dorchester, took up the present season, on his farm, 70 pounds of honey of good quality, "made by one hive of bees, in forty-one days." Mr. Samuel Brigham, of Southborough, exhibited a glass hive, excellently well constructed, and containing a large quantity of honey in the comb, the bees being still alive; these industrious manufacturers will keep possession of the premises until the spring, when they will resume their labours. Mr. Brigham took up on his farm the present season 180 pounds of honey.

Four cases, containing cannisters of mustard, manufactured and exhibited by Mr. John P. Webber, of Beverly, in the county of Essex, packed in a very neat manner for transportation; on trial it was found to be of an excellent quality, not inferior in the opinion of your Committee to the best imported Durham mustard.

THOMAS L. WINTHROP,
ISRAEL THORNDIKE,
WILLIAM PRESCOTT.
BENJAMIN GUILD.

The further claims for premiums on agricultural experiments will not be decided upon until the Trustees' meeting in December next, affording time for the competitors to exhibit the evidence required—soon thereafter the Committee will make an additional report.

No. 7.

The undersigned, a Committee appointed to test the merits of the Working Cattle, and award the different premiums, have attended the duty assigned them, and

REPORT as follows, viz. Fourteen yoke of cattle appeared on the ground, and had been regularly entered. Several

persons who had entered their cattle were prevented attending in consequence of sickness in their families. One yoke was rejected, having received one of the premiums last year; the cattle at that time were three years old. Trial was made on the ground used several years past for that purpose. The waggons with their contents of stones weighed 5000 pounds, the weight drawn by each yoke of cattle. Your committee, after a careful trial, and as they hope discriminating correctly, award the following premiums, viz.

To John Scammel, of Bellingham, the 1st premium	\$25
Perley Tapley, of Sutton, the 2d premium	20
Benjamin Woodbury, of Sutton, the 3d premium	15
Royal Marble, of Sutton, the 4th premium	12
Samuel Sibley, of Sutton, the 5th premium	8

Your committee considered the cattle as superior to any exhibited at any former cattle show in this place; but in training, particularly in backing with the load, they were sorry to observe a great deficiency.

All which is respectfully submitted by

CORHAM PARSONS,
SAMUEL G. DERBY,
ELIJAH PERRY.

No. 8.

AGRICULTURAL REPORT.

The Committee on Agricultural Experiments, recommend that the Trustees authorize the Treasurer of the Society to pay premiums to the following persons, in addition to those named in their report of the 20th of October last, to wit:—

To Messrs. Tristram and Henry Little, of Newbury, in the county of Essex, twenty dollars, for having raised the greatest quantity of Mangel Wurtzel, being 924 bushels on one acre. A description of their culture is as follows—
“Upon a clay soil, the most stubborn and sterile that we

think of tilling, the said lot has lain down to grass since the year 1812, until the summer of 1823, when it was ploughed, and planted with potatoes, and would not have been ploughed then but to destroy the white weed with which it is infested ; the soil on the most part of the lot is so thin that in ordinary cases it breaks and cracks ; the other part of the lot is more fit for the plough ; this will show that the Mangel Wurtzel root will thrive on a clay, though perhaps not to that size which it will do on a more loamy soil. In 1824 this piece of land was cultivated with potatoes, and manured in the hill with about 10 ox cart loads of good manure to the acre ; and yielded about 100 bushels. In April, 1825, the land was twice ploughed, one plough following the other, which threw it up in ridges about one rod and a half wide, and wide furrows were left to carry off the superfluous moisture. The ridges made smooth with a harrow, and furrows opened on the ridges about $2\frac{1}{2}$ feet apart, and 10 ox cart loads of compost manure were put in the furrows, which was covered with a double mould-board plough ; they were sowed and cultivated similar to the statement made in page 245, Vol. VIII. of the Massachusetts Agricultural Repository ; and harvested between the 1st and 11th of November ; the produce was 23 loads and 16 bushels ; 2 average loads were weighed, the weigher's certificate will show the weight of the crop.

Messrs. T. and H. Little are also entitled to the Society's premium of twenty dollars, for having raised the greatest quantity of barley, being $51\frac{1}{2}$ bushels on an acre ; "the soil is a clay loam, in 1824 was planted with potatoes and manured with about 30 ox cart loads of manure to the acre, the manure was principally marsh mud, put in the drill, and something like 200 bushels were obtained. In 1825, April 23d, it was ploughed, and $2\frac{1}{2}$ bushels of barley were sowed on the same, 4 loads of dirt or dust drawn from under the barn were spread on one half of the piece, on the other part one half load of leached ashes were spread.

which half load, thin as the dressing was, we think was as good as the dressing on the other part—it was harvested on the 27th of July, threshed as soon as convenient; and the aggregate was $51\frac{1}{2}$ bushels."

To Joseph Little, Esq. of Newbury, the premium of twenty dollars, for having raised the greatest quantity of common English turnips on one acre, being 814 bushels; "the soil, says Mr. Little, is what would be generally clayey loam; it had been 7 years to grass, and so long without any manure that it produced short of one half a ton of hay when it was taken off the last of June;—the first of July it was ploughed and harrowed well, after which it was furrowed at a distance of nearly 3 feet, and 25 ox cart loads of compost manure strewed along the furrows, the compost was made of 13 loads of strong earth, taken from pond holes and sunken places, and 6 loads from under the beds of the cattle in the barn; and the same number of loads from the vaults of privy houses; which was twice or thrice thrown over for the purpose of equalizing the whole as to strength; the manure was then covered with a double mould-board plough, the seed was sown with a machine made for the purpose, one row on each ridge; the quantity of seed was nearly 4 pounds, perhaps half that quantity would have been sufficient; the ridges were rolled over with a hand roller; when the turnips were of some bigness they were thinned by hand at a distance of about 3 inches, and afterwards were hoed once only; but the weeds were pulled out by hand; the crop was harvested the 1st of November, by myself and boy, and my hired man by the name of Kinnison, whose certificate is enclosed; there were by accurate measurement 814 bushels. The entire expense of ploughing, harrowing, getting the seed into the ground, including \$25 for the manure, was fifty-three dollars."

To Payson Williams, Esq. of Fitchburgh, for having raised the greatest quantity of spring wheat on one acre, being 37 bushels, the premium of \$20; the culture of his crop as

follows : " After taking off a crop of potatoes (500 bushels) raised in 1824, and about the setting in of winter, the field was thrown into ridges by alternate back furrows ; I had two ends to answer by this furrowing : the field being a slightly inclined plane, pitching to the east, would drain sooner the following spring without danger of washing ; and, secondly, to learn if the family of grubs would stand our hard winters in the open air. About the middle of April I split the ridges, and when sufficiently warm and dry, ploughed the other way deep and fine--sowed 3 bushels of Gilman wheat, well limed, 1 bushel of Herds Grass and Red Top, and 4 pounds of Red Clover seed—harrowed this in across the furrow ; at this time the soil was warm and finely pulverized, except several rods at the south end of the lot, which was rather moist ; the roller was now passed over the field. The 1-4th part of the field, the most moist, was again ploughed and harrowed ; this part of the field, at harvest, showed large straw, but less amount of ear or head than that left under the roller. I mention the result of this experiment the more readily, as I had previously been much averse to the use of the roller at the time of sowing, but am now of the opinion, that if the earth be light and warm at sowing, the roller may be used to advantage, if the land be not too rocky, inasmuch as all small stones may be put out of the way of the scythe ; the crop of wheat probably enduring the drought better. When the wheat plants were about 4 inches high, I sowed on them 4 barrels of strong wood ashes ; whether the ashes had any effect to check the worm or maggot which had usually attacked my wheat at the root, I know not ; but will state that no such attack was suffered the present season. The wheat was cradled the 27th of July ; on the 28th and 29th it was bound up—the number of sheaves being about 800, and carted to the barn.—Sept. 6th the threshing was finished, the crop being 37 bushels and 4 quarts of excellent wheat so pure from the mixture of other grain, that I think

I may hazard the assertion that not 100 kernels of any other grain can be found in the whole product. I weighed one bushel and found it to be 65 pounds; the superfine flour from the same being 47 pounds, with several pounds of middlings. The straw when housed being remarkably light, I consider equal to one ton of good hay. You will perceive, gentlemen, that my expenses on crops are generally much beyond my brethren of the sod; yet I do affirm that a wheat crop can be profitably grown in old Massachusetts, if our lands be properly prepared. The value of the crop \$65,50—entire expense of raising the same \$32,92.

Mr. Williams is also entitled to the society's premium of \$20 for having raised the greatest quantity of potatoes, being 609½ bushels on one acre: "the field is near the top of a gentle swell or hill inclining to the south and east, the soil a deep yellow loam, bedded on a stratum of blue gravel, the hardness of a well beaten road, the field 7 years ago produced an amount sufficient to draw the society's premium for the greatest crop of potatoes,—the year following the society's premium for the greatest quantity of spring, Gilman wheat; since that period I have taken from it from one to two tons of hay annually. In the fall of 1824, the sward was turned under; the following spring after spreading on 43 loads of unfermented manure from sheep and neat cattle, it was cross ploughed, harrowed down, and furrowed 3 feet distant, and one large potato placed at two feet distance the other way, and lightly covered; the planting was finished the middle of May; weeding finished the 1st of June; the 2d and last hoeing the last of June; after which the weeds were pulled as occasion required, 'till the tops of the potatoes covered the ground. The excessive drought the past summer was undoubtedly an injury to the crop, but not to so great a degree as to other fields planted in the old fashion way 4 feet asunder, as at the most critical time my vines covered the ground, thereby interposing a partial shield to the scorching rays of an almost killing sun. From

repeated experiments I am confirmed in the belief that in our mode of culture 3 feet by 2 feet is as good, and probably the best distance for potatoes. The kind of seed used the present season were in part the Rio de la Plata or Reds, and part Pennsylvania Blues ; their produce side by side, was nearly equal. The quantity of seed used was 30 bushels of the finest potatoes of the preceding crop ; small unripe seed never should be planted ; the crop was harvested between the 23d and 29th of October, the amount 609 $\frac{1}{2}$ bushels, many of which weighed 2lbs. each. Before closing this statement, I will give it as my opinion, that had I placed the manure in the hills, instead of spreading it on and ploughing in the same, I should not have had 500 bushels ; and as my further belief, that had there been no drought, I should have had over 700 bushels from the acre : The value of the crop \$152, 38, the entire expense of breaking up the field, of the manure, and spreading on the same, hoeing, harrowing, and harvesting the crop, \$54, 33, leaving a profit of \$97, 55."

To Mr. Leonard Hill, of East Bridgewater, in the county of Plymouth, the premium of \$20 for having raised the greatest quantity of flax on half an acre, being 310 lbs. Mr. Hill's description of his culture is as follows : " In Sept. 1823, I broke up a piece of ground, being a part of my farm which before had produced some small crops of hay ; it is a level field, and the soil of a clay loam ; there was by estimation about half an acre in the piece ; in the spring of 1824 it was twice ploughed, and manured with 25 cart loads of barn manure, and planted with Indian corn, producing about 25 bushels. In April last it was again ploughed, harrowed, and cross ploughed ; previous to the last ploughing 24 cart loads of good manure were spread upon it, and then again 15 bushels of dry ashes were scattered over it; afterwards it was twice harrowed ; the 2nd day of May I sowed 5 pecks of clean flax seed over the piece, and again harrowed it over with a brush harrow : about

the 25th of July the flax was pulled and housed, and as soon as dry the seed was beaten off, cleaned, measured, amounting to $7\frac{1}{2}$ bushels; the flax was spread about the middle of September, and rotted, and then housed again; in the month of November it was dressed out clean for market, and weighed; the whole quantity taken from 92 rods, was 357 lbs., the expense of cultivation, dressing, &c. was \$23, 50 cents."

To the Rev. Morrill Allen, of Pembroke, in the county of Plymouth, \$30, for his experiment to prove the best season and mode of laying down lands to grass. Mr. Allen makes the following statement: "Several disappointments in my expectation of a crop of grass after sowing the seed in the spring with grain, induced me as early as the year 1807 to try the effects of autumnal sowing; my first experiment was made on about 16 rods of land, a part of which was sowed in the month of October with rye and herds-grass, and the residue with herds-grass seed alone; the cold weather did not commence very early in that year, and both the rye and grass had considerably extended their roots before winter. In the following summer at the time of reaping, the grass had grown so tall among the rye, that much of it was cut with the sickle; but it appeared less healthy and vigorous than the grass which was sowed alone; this produced nearly a full crop the first year, and endured unusually well afterwards. The next year the crop where the rye had been raised, appeared to me to be considerably better than usual after spring sowing with grain, but less than on the other part; the result of this experiment encouraged me to sow grass seed in the fall, and without grain. In several successive years I ploughed and sowed my fields after Indian harvest; the crops were generally much more abundant than spring sowing; but in some instances when the autumn proved cold, the first crop was imperfect, and intermixed with some weeds; I supposed earlier sowing would be more certainly successful;

and in 1820, about an acre and a quarter of land, which had been naked fallowed, was sowed with herds-grass and red clover, between the first and 20th of September. In 1821, the herds-grass was ripe for cutting; at the usual season 15th of July, it was unusually tall, but not so thick set as in subsequent years; very little of the clover appeared the first year; it increased in the 2nd and 3rd years; the usual order seemed to be exactly reversed in this instance. When clover and herds-grass are sowed with spring grain, the first crop is chiefly clover; afterwards there is a greater proportion of herds-grass; this circumstance has lead many farmers to the conclusion that it requires more time to establish the roots of herds-grass in the earth, and prepare them to produce a full crop, than it does the roots of clover; every experiment I have made has tended to prove this a wrong conclusion, and that herds-grass naturally comes forward earlier than clover, the reason why the appearance has so often been otherwise, probably is the obstruction produced by the grain crop on the growth of the grass; the clover being a tap rooted plant, is not so much obstructed as the herds-grass; and drawing some of its nourishment from a greater depth, it soon ascends the injury; unobstructed by grain, I have observed that herds-grass always takes the lead of clover in its growth. In the spring of 1823, I ploughed about 3 acres of land on which Indian corn grew the preceding year; nearly half the field was a cold clayey soil, and the residue - a gravelly knoll; it was sowed the 1st of May with oats, herds-grass, and clover seed; another field of 3 acres, the soil clayey, and apparently of the same quality with the low part of the other field, was naked fallowed; it was ploughed 4 or 5 times, and sowed with herds-grass and clover, the 1st of September; the comparison could properly be made only between the low part of the first field, and this, where there was no perceivable difference in the character of the soils: in 1824 the quantity of hay per acre

on the land sowed in the fall was at least double to that on the land sowed in the spring, and with grain; the past season the difference was not as great, yet very observable. The same experiment was repeated in 1824 on about four acres of light sandy soil; the seed on the fallowed land in that year was sowed the last of August; the season was uncommonly dry; and where oats were sowed scarcely any herds-grass appeared the past season; but that part sowed with grass seed alone produced a good crop for light soil, and at this time there appears to be on it a sufficient number of grass plants, while the other part of the field looks like exhausted land. From the results of these several experiments I am led to believe the best time to commit grass seed to the earth, is from the 15th of August to the 15th of September; this time seems to accord with the intentions of nature, it is the season of ripeness in the seed when it spontaneously falls on the ground; grass seed which is sowed in the last of summer, or the beginning of autumn, is rarely if ever obstructed in its early growth by drought, which often proves destructive to young grass in the summer months; it gets firm hold of the ground before winter, and in the following spring grows more rapidly than grass on land which has been hardened by the heat of summer, and the growth of a grain crop. The season which appears to me to be the best for sowing grass seed, is far from being the most convenient for farmers; they cannot often do it at that time without too little preparation of the soil to receive seed, or the loss of one crop; my experiments have proved to my own satisfaction, that much later sowing is preferable to spring sowing with grain; in one instance I prepared the land late in the fall, and cast the seed on the snow, with very good success; on fields designed to be alternately in grass and tillage, the common practice of sowing grass seed in the spring with grain, may consist with good husbandry, for as often as wet seasons ensue, the grass will prosper tolerably

well, and in case of a drought which destroys the grass, the rotation may be changed without any other loss than that of the seed ; but on fields which are unsuitable for frequent ploughing, when we wish to have the cultivated grasses remain as long as possible ; and on sandy soils, where it is difficult to get a sufficient number of grass plants established, the loss of a single crop is trifling, in comparison with the gain which will be realized by sowing grass seed in the month of August." In awarding this premium the committee do not mean to admit that the experiment of Mr. Allen proves conclusively that his is the best method of laying down land to grass ; but that the labour, and result of his several experiments, induce them to recommend that the premium be awarded to him.

To E. Hersey Derby, Esq. the premium of \$30, for having raised the past season on about 14 acres, "the greatest quantity of vegetables, grain, peas, and beans excepted, for winter consumption, on his own farm," to wit :

Cabbages, at 56 lbs. per bushel	1303
Pumpkins, 7 ox-cart loads	294
Potatoes	415
Mangel Wurtzel	2036 $\frac{1}{2}$
Sugar Beets	274
Russian Radish	90
English Turnips	1026
<hr/>	
Bushels	5638 $\frac{1}{2}$

Mr. Derby makes the following communication : I have placed the potatoes, mangel wurtzel, and sugar beets in my barn cellars ; the Russian radish, and English turnips on the barn floors, and covered them with salt hay ; for the cabbages I have taken a piece of grass ground in an airy situation, placed them upside down, close to each other, and covered them with a light covering of sea-weed. This method of preserving my vegetables I have practised several years, and found it to succeed perfectly well. The land in

tillage this year is estimated at about 14 acres. I expect to winter from 20 to 30 cows, together with some young stock. The cost of each particular kind of vegetable, it would be extremely difficult for me to ascertain, the work of my farm being very much blended. I should think the cabbages were raised at the least expense, next the English turnips: then the sugar beets and mangel wurtzel; and all of them at as little expense per acre as an acre of potatoes."

For having raised the greatest quantity of Indian corn, on an acre; winter wheat, rye, millet, carrots, common beets, sugar beets, parsnips, ruta baga, onions, cabbages, peas and beans, no premiums have the present year been claimed. For the Committee,

THOMAS L. WINTHROP, *Chairman.*

Boston, Dec. 10, 1825.

THE PRODUCTION OF SILK AND OF WINE IN THE UNITED STATES.

The following articles must be interesting to all the citizens of the United States. They propose the introduction of new objects of industry; and although they may not be as successfully cultivated in New England as in the warmer and more favoured climates of the Southern States, yet they cannot fail of being interesting topics to us, as citizens of the United States.

It is indeed a most unexpected view of the case, that our imports of *silk* goods alone should exceed by half a million of dollars all our exports of flour and bread stuffs. We make no apology to our subscribers for copying these articles from the American Farmer. There is no pride so narrow as that which leads the Editors of public journals to prefer in all cases *original* to selected matter. The great object of the public communication and diffusion of knowledge is thus defeated.

The American Farmer, (we say it with deep regret,) is seen by a very small proportion of the Farmers of New

England. This does not arise from any local prejudices, but from the character and condition of our population. Our Farmers are compared with those of the Southern States in narrow circumstances. They are not able to devote either the time or the money which the extensive planters of the south can afford to do, to reading and research. In proportion to their ability our yeomanry do full as much, and feel a zeal quite as strong to cultivate their minds, but they are restricted by their means. It is our duty therefore, to give the circulation which our journal affords to the information, and valuable suggestions which are found from time to time in the pages of the American Farmer. To this course there is to be sure one objection, which is, that some of our readers here, and all in the Southern States, though they are few, are exposed to the vexatious repetition of the same articles, but this is not an evil to be compared with that of withholding such articles from our subscribers. Three-fourths of the readers of this Journal would never see in any other way what we are about to publish.

We would remark, that we still remain firmly convinced, that it can never be the interest of the Farmer of New England to raise the vine, either for the purpose of making wine, or for distillation and the manufacturing of brandy. As strong reasons exist against the cultivation of the vine for the purpose of converting its products into brandy, as against raising it for the production of wine.

The great objection to its culture for wine is the deficiency of sugar, or saccharine matter. This defect is so great in our climate, that cultivators are obliged to add a quantity of sugar to the *must*, or expressed juice, to give it sufficient body. And this defect would be still more sensibly felt in converting it into brandy. On the whole, we are persuaded, that we had better exchange our own natural products for the wines and brandies of other countries, and that our labour and capital will be thus more profitably employed.

But the question as to the production of silk is a very dif-

ferent one. We *can* raise silk, and we can raise it as easily as it can be produced in China or Italy. The white mulberry, the favourite food of the silk worm, thrives in Massachusetts, as well as it does in any part of the world. The chrysalis or cocoon can be easily preserved during our winters. It is not a question of doubt, it has been settled by experience. It has been asserted that the inhabitants of Mansfield now raise silk to the amount of 40,000 dollars a year.

Mr. Clark, of North Hampton, 30 years since, raised the silk worm with complete success. Mr. Holcomb, of Sterling, has been equally successful.

The power to produce silk in Massachusetts, therefore, is ascertained—the only question is as to its comparative profit. That one town should be able to raise it to the amount of 40,000 dollars a year, would seem to go very far towards proving its profitableness. The inhabitants of that town can have no fear as to a disclosure of the facts—they can have no reasonable motive for concealing them—they have no monopoly—and an increase of American production of silk would rather aid than injure them by inducing the government to protect and encourage it. It would be desirable that some person who has raised silk extensively, or (if not extensively) for some years in succession, should state its comparative profit with that of other objects of labour.

The Massachusetts Agricultural Society will grant a premium for the raising of mulberry trees with the view to the production of silk, and that premium will be announced in their next list.

We shall also, if we have time, insert in this journal full notices as to the best mode of raising the mulberry, and the care and management of the silk worm.

We have never placed the culture of silk among the visionary projects, but have always believed that the United States would raise its own silk at no distant day. It

only remains to be seen whether we can raise it to more advantage than to import it, which can never be ascertained before a fair trial shall have been made. Accident, the revocation of the edict of Nantz, first introduced the manufacture of silk into Great Britain, where it has flourished to as great an extent as in Italy. Yet Great Britain imports nearly the whole of the raw material. There is not a doubt that we can do better.

From the American Farmer of Jan. 6th, 1826.

DOMESTIC MANUFACTURE OF SILK AND BRANDY.

[The proceedings in Congress on the interesting proposition of Mr. Miner, of Pennsylvania, which we publish below, have brought to mind the following memorial, which was recently sent to us by a distinguished member of the Legislature of South Carolina; to show the progress of the public mind in the developement of our agricultural resources, and the great probability of the successful establishment of new and profitable branches of industry, to which the labour of the country may be diverted from others, in which production has grown out of all proportion to consumption, and which have, of course, become losing concerns. We understand that the objects sought by the memorialists have been granted by the legislature of South Carolina, and we shall not fail, with the aid of many and good friends in that state, to mark the growth of the vine and the silk worm. Mr. Miner is entitled to the thanks of the friends of agriculture, if it be only for shewing, that in the din of conflicts amongst other interests for all they can get of artificial guards and legislative protection, she, too, has a voice to be heard.]

In Congress, 29th December, 1825.

On motion of Mr. Miner, of Pennsylvania, it was

Resolved, That the Committee on Agriculture be instructed to inquire whether the cultivation of the mulberry tree, and the breeding of silk-worms, for the purpose of producing silk, be a subject worthy of legislative attention.

And should they think it to be so, that they obtain such information as may be in their power, respecting the kind of mulberry tree most preferred; the best soil, climate, and mode of cultivation—the probable value of the culture, taking into view the capital employed—the labour and the product—together with such facts and opinions as they may think useful and proper.

Resolved, That the Committee inquire whether any legislative provisions are necessary or proper to promote the production of silk.

Mr. Miner said, that he held in his hand a resolution which he intended to offer for consideration; but before it was read from the chair, he would say one word to bespeak for it a favourable reception. Its object was to direct the Committee on Agriculture, to make some inquiry relative to the cultivation of the mulberry tree and the breeding of silk worms for the production of silk. That this was a matter of more importance than might on the first impression be supposed, Mr. Miner stated, would be seen, by referring to the report from the treasury of last year. He there found that the value of silk imported was \$7,203,338;* an immense amount; that the exports of wheat, flour, Indian corn and meal, amounted to \$6,713,595. So that the importation of silk exceeded the exportation of bread stuffs, by near half a million; that the export of tobacco amounted to \$4,885,566; the products of the sea to \$1,610,990; of the forest to \$4,839,646. Compared with either of these, the importance of our silk trade would be apparent, and the value of the production of the article might be inferred. Mr. M. did not know at present, what legislative measures, or whether any, would be proper; but the Committee could judge: he rather looked to advantage from the Committee obtaining and spreading abroad, in their report, all the information that could be obtained, which might arouse public attention to the subject, and convey valuable information.

* Mr. M. should have stated that about a quarter part of this amount was re-exported.

MEMORIAL

*To the honourable the President and Members of the Senate of
the State of South Carolina.*

The respectful memorial of Antonio Della Torre and James C. W. McDonnell, sheweth--that considering the very serious changes which have taken place in this state within a few years, and the prospect of the more extended cultivation of cotton, (the chief staple of South Carolina,) in other states of this Union, in South America generally, in the East Indies, in Mexico and in Egypt; your memorialists have concluded that the investment of their capital in the cultivation of cotton will ultimately prove of very questionable advantage. In the examination of the mode by which they might best serve themselves, your memorialists are convinced that they have discovered what would be of incalculable advantage to the state at large. The principle is no novelty. It is admitted by political economists, that the introduction of a new and valuable article of culture into an agricultural country is the clearest benefit to the public; your memorialists will introduce two new articles, capable of the most extended culture. The productions to which they allude are of this description: they are consumed in South Carolina, but not produced by South Carolina. Our state pays money to foreign countries for what she could raise at home. That the home consumption could not be met for some years, is true; but it is no less true, that in time she could not only plentifully supply her own wants in wines, cognac brandy and raw silk, but she would be enabled to export thousands of gallons of wine and cognac brandy, and thousands of pounds of silk to her sister states and to Europe. This would of course be adding to the capital of South Carolina by retaining the money she now sends tributary to foreign countries, for those articles of comfort and luxury, but in time also, by drawing into her treasury much of the capital of her sister states and of this great continent, she would at once in-

crease her wealth at home, and her rank and consideration abroad, and give new energy to her agricultural and commercial interests. All this would greatly enhance the value of her lands, which are now materially depreciated, inasmuch as it would create a new demand for land to produce those new and valuable articles.

There is another subject on which your memorialists will but respectfully observe, South Carolina has suffered material embarrassments in the mercantile portion of her community by the withdrawal of specie from the general circulation, by the reiterated demands of the Bank of the United States upon the local banks of this state for silver, in order to transmit to the General Government the amount of the revenue raised in her ports; she has long complained that the money so raised is expended in northern cities without any adequate return. This is not only true as regards the duties paid at the custom houses in this state, but is in part true as regards the duties paid at the custom houses in other states on articles re-shipped to this state. For instance, from October, 1824, to October, 1825, there were imported into Charleston direct, forty-four thousand seven hundred and thirty-two gallons, (44,732,) of wine, and fifty-nine thousand two hundred and fifty (59,250,) gallons of brandy; the duty on both articles amounted to forty-six thousand and twelve (46,012,) dollars; presuming that there are half as much more of wines and brandies entered at the custom houses in New York, Baltimore, Savannah, &c., and re-shipped to this state, the duties on importation, being necessarily added to the price, the payment of those duties would devolve also upon the consumers here, and the citizens of this state would pay to the General Government sixty-nine thousand and eighteen (69,018) dollars a year for the mere privilege of importing what she could make at home. If then South Carolina would raise any of the articles which she now imports, she would not only save the duties on the direct or indirect importation, but she also

would enable her own merchants to meet the foreign merchants in other parts of this Union, with the advantage of the whole duty in their favour.

To effect this your memorialists propose introducing an industrious and well conducted free white body of labourers, who are habitually acquainted with the peculiar culture of the vine, the process of making fine wines, cognac brandy, and the raising of silk. This would, they humbly conceive, give a spur to the industry of the poorer classes of citizens in the upper and middle districts, as well as give them the power of earning an easy livelihood on weak, much worn lands. From those products being more valuable than cotton, and the vine requiring but a short time in winter to prune, and a few days in summer to harvest, express and distil, (leaving the remaining portions of the year free to cultivate any other articles,) their culture would much increase the value of negroes, inasmuch as the value of the field hand must be in proportion to the value of the products of his labour.

There are several kinds of grain and many fruits, as olives, &c. which are cultivated in Italy beside those, which are valuable both in their natural state and in the results of expression or decomposition. The introduction of those fruits, &c. particularly the olives, would be attempted by the same labourers; but your memorialists cannot be certain of the results, since the olives have only been tried in Charleston and on the coast; but of wine, brandy and silk they are certain, because they have been made in different parts of this state and North Carolina, and they feel assured also that the Great Author of nature would not have caused festoons of the wild grape to adorn many parts of this state, if He intended to declare—"this shall not be a wine country."

Your memorialists are aware that from some imperfect attempts which have been made, a doubt of the practicability of introducing the extensive and profitable cultivation

of the vine in this state might arise in the minds of many ; but when circumstances are exposed, the causes of failure will be evident, to wit : that the company of persons who, prior to the revolution, made the attempt in 1796, or thereabouts, did so, upon the French system of low culture, which is not as well adapted to a new country covered by woods, as the high culture of the Italians in Lombardy, &c. ; and moreover, that the climate is much changed since then, by the clearing of the lands, rendering them warmer and drier and more favourable to the culture of the vine. That the attempt *at introduction*, of private individuals, should fail, ought not to be attributed to the climate or soil, but to other sufficient causes, viz : 1st, to our labourers (negroes for the most part) being uninterested and ignorant of the peculiar culture of the vine ; 2d, to the nature of our institutions, which to render permanent, it is wisely ordered that property here shall not be hereditary, but shall be liable to sale, division and dispersion amongst the several creditors or heirs. Thus, however successful the undertaking of a private individual like Mr. Naudrez, of Camden, may appear at first, its existence must, in all likelihood, terminate with his own. Private attempts *at introduction* will not succeed till a nursery of knowledge is established, from which the successor or heir to an estate could derive the information necessary to carry on the vineyard. The agricultural society of this State undertook to establish a vineyard about the year 1799, but its members were personally inexperienced in the peculiar culture of the vine, their labourers were hirelings, who did but little, and finally their funds failed them. An experienced vine-dresser would unhesitatingly declare it impossible to succeed *in introducing* the culture of this valuable plant by those means ; but with labourers practically acquainted with its culture and interested in the result of their labour, together with a large efficient capital and good management, in any dry elevated situation between the 25th and 51st degrees of latitude, success would be undoubted.

That this is not a wild speculation on the part of your memorialists—that they have not projected so vast an undertaking, without foreknowledge and much continued reflection, they beg leave to state, that one of them, Antonio Della Torre, is a native of Italy, where he was in the habit of daily seeing and aiding in every process in the making of wine and brandy in his father's vineyard, and those of his connexions; that they have been examining into the practicability of their places for two years, and deeming it absolutely necessary (to secure success,) to procure the practical vine-dressers as well as the vines, they have had an agent in Italy for that purpose for more than fifteen months, who writes them word, that a number of persons, in families, of good characters, were ready to come out as soon as the means were afforded them and their promised farms were ready for their reception. But your memorialists find their capital insufficient. However liberal and free from objection their places are, for they have anxiously and jealously examined them, and however beneficial to this country they would prove, they cannot carry them into effect unless aided by the state. Italy, France, Germany and Hungary were not originally wine and oil countries; but the vine, the silk-worm and the olive were introduced by enterprising individuals, encouraged by their governments, and those countries now abound in delicious wines, sweet oil and silk; and may not our republican institution be looked up to for sound policy, and confided in for the wisdom and liberality of its decrees, when that wise liberality is calculated to redound a thousand blessings to the people. They trust it is evident to your honourable house, that the introduction of the vine, the silk-worm and the olive will yield a thousand blessings to the people of this state; and they think it is also evident, that the experienced vine-dresser and maker of fine wines and brandy, the rearer of the silk-worm and expresser of olive oil, ought

to be brought over to insure those advantages, by forming a nursery of knowledge from whence practical information may be extended over the state ; that those persons ought to be stockholders, having a deep interest in the products of their labour so as to excite them to make every exertion, and that they ought to be in sufficient numbers to meet the demands of the enterprise ; that wherever their vineyards are located the lands in the vicinity would rise in value ; and as their products advance the comforts and pleasures of life, in proportion as their village and vineyards beautify the up-country, many of our citizens who now seek amusement abroad, expending thousands of dollars amongst the inhabitants of the north, to the impoverishment of the state, will in time find more pleasure, comforts, and amusing novelties, attend a tour through the upper country, in visiting the village, &c. of those farmers, and the many vineyards, silk and olive establishments of our present citizens who will adopt the culture and extend them over Pendleton, Greenville, Abbeville, York, &c. Thus, by your wise provision, you will allure your wandering children from foreign excursions, and entice them to expend those vast sums of money annually amongst their peculiar brethren of the upper and middle districts : that the present expenditure of this state for foreign wines and brandies, to wit, thirty-three thousand six hundred and thirty (33,630,) dollars for wines, and seventy-five thousand five hundred and ninety-two (75,592,) dollars for foreign brandies—and also, the sixty-nine thousand and eighteen (69,018,) dollars to the general government, as custom house duties on both articles, amounting in all to the large sum of one hundred and seventy-eight thousand two hundred and forty dollars, would annually be preserved to the state, and circulated amongst the agriculturists of the upper and middle districts. As the balance of trade can only be preserved by the value of the exports equalling that of the imports, South Carolina would, by the cultivation of these articles, be enabled to

preserve that balance in her own favour, and by the export of those rich articles of commerce, wine, silk, brandy, and perhaps olive oil, your constituents would become prosperous and happy, and under your auspicious banner would South Carolina ascend this proud eminence amongst her sister states.

As they trust they have fully shown how their individual enterprise would benefit that state which will extend the shield of patronage over its infant head, your memorialists now beg leave to explain the necessity of that patronage thus : The vines will not begin to bear under three years, and the crops are not abundant till after the fifth year, the mulberry trees must have age before they will yield leaves enough for the use of the silk house ; the olive trees must acquire a certain age before they begin to bear fruit ; and in short, although they will yield abundant benefits to the state, the labourers, and the projectors, *in time*, as the subsequent documents will prove—yet, during that lapse of time, (from three to five years,) little or no interest can be obtained from the amount invested. Your memorialists, therefore, find, that to insure the *efficient* introduction of those articles, so as to secure their permanence and profit to the state, would require a larger capital than they could command ; and that unless aided by your honourable body, they would be unable to make the attempt without great risk of failure and ruin. But if your honourable house shall deem their views correct, of the ultimate prospect of cotton becoming, in five or six years, so common a staple over Egypt, the East Indies, South America, Mexico, the middle and southern states of this Union, the Floridas, and the vast territories bordering the Mississippi and Missouri rivers, so as to become valueless to the citizens of this state, as an article of profitable exportation, they trust that their effort to provide additional and most valuable staples in due time will not be considered as premature, and that forty thousand dollars will not be thought too much to loan to the ad-

vancement of so important an undertaking. Your memorialists, therefore, pray, that your honourable body will grant them a loan of forty thousand dollars on sufficient security for five years, without interest, and the after instalments to be so regulated as not to crush the establishment; and any other aid which you, in your wisdom, may deem necessary to advance the agricultural prosperity of the state, and to induce the industrious and inestimable vine-dressers of Europe to take shelter under your paternal government, and who in return will not only pay the money thus loaned, but will make your country rich in the production of the delicious wines of Italy, France, and Hungary; in cognac brandy, silk and olives, and from whom your present citizens will acquire every instruction in their peculiar culture and manufacture. And your memorialists will most respectfully pray, &c.

ANTONIO DELLA TORRE,
JAMES C. W. M'DONNALD.

REVIEW.

In Encyclopædia of Gardening, comprising the theory and practice of Horticulture, Floriculture, Arboriculture, and Landscape-gardening, including all the latest improvements; a general history of gardening in all countries; and a statistical view of its present state, with suggestions for its future progress, in the British Isles. By J. C. Loudon, F.L.S. H.S. &c. London. 1825.

No apology can be necessary for calling the attention of our readers to the first, full and complete treatise on a subject of universal application, intimately connected with the best interests of agriculture. Besides the interest, which every farmer in the neighbourhood of great cities, and who supplies their markets, must necessarily feel, it is a valuable accomplishment to every other farmer, as soon as society has arrived at its second stage of improvement. Hor-

ticulture or the art of gardening may be considered as an index of the state of civilization. So long as the only object of the cultivator is to subdue the wilderness, and procure a mere subsistence, you are not to look for any progress in horticulture or gardening—but whenever these first difficulties are overcome, the attention of the farmer, when his houses and barns are all completed, and his fields subdued to the plough, will be to procure for his family, the luxuries of life; and what luxuries are so much at his command as those which his *own* soil, his *own* industry, and skill can readily furnish? Indeed an improved state of agriculture, such as we are constantly striving to encourage, such indeed as these old-settled States of the north seem to require, if they would wish to keep their excellent population at home, is nothing less than a system of enlarged horticulture—it is the application of gardening to field cultivation. The root culture, so much and so generally adopted in Europe, and recently introduced with us, is in fact transferring from the limited garden to the *field*, the cultivation of certain plants, which had formerly been confined to the former. From whom ought the best lessons as to their cultivation, to be expected, if not from those, who have been employed in cultivating these plants in gardens?

There are very powerful motives for encouraging horticultural knowledge in the New England States, arising from the direction which has been recently given to the capital of these States. It is of little moment now to consider, whether it was, or was not wise, to divert the capital of this country from commerce to manufactures. It *has been done*, and every wise man will admit, whatever may be his views of the policy, that it is *irrevocably* done. The new interests, created by the policy of the national government, are so great and extensive, that we must be a manufacturing people. The effect must be the same, as the same policy has produced in other countries. Villages, towns, and even cities will arise in places, where agriculture would never

have flourished without such an excitement. The sandy and unfertile banks of the Merrimack; the sterile plains of Seekonk, must be made to furnish the vegetables and fruits necessary to the support and comfort of many thousands of persons employed in manufactories. These persons cannot raise the productions necessary to their sustenance, but produced they must be; transported from great distances they cannot be. It follows of course, that the gardening system will prevail in the vicinity of all such establishments.

But this is not the only ground upon which the importance of propagating correct ideas as to horticulture rests. The gardener, the professional gardener, extends his culture to every species of fruit and vegetables, which the taste of the consumer demands.

Confined to this culture, his success depending solely upon it, he invents new modes of cultivation; he watches with more close attention, both the impediments which obstruct, and the processes which facilitate his success. The opportunities thus afforded to the gardener, to watch the progress of plants, and the evils to which they are exposed, and to provide the remedies, are incalculably greater than those which common farmers occupied with objects more interesting can possibly have. The principle of the utility of the division of labour can no where be more sensibly felt than in this example. The *wonders*, (for they are truly such,) which have been effected by this limited and exclusive direction of human ingenuity, can only be well understood by those who have made it their study.

The gardeners of Europe have introduced not only the plants of the tropical regions into the most unfriendly climates, but they have succeeded in naturalizing many valuable hardy plants, and by gradual measures adapted them to their own unfavourable soil and climate.

If the whole amount of actual gain by the triumphs of this art could be stated in a short review, it would create

surprise. We are sensible that much of this *acquisition* would be considered at this moment, in *our country*, an idle, and almost worthless effect of mere luxury. Yet sensible men would pause, before they pronounced such a harsh censure. They would compare this species of luxury with others which we *have adopted*. They would say, if you pay seven millions of dollars for silks, and some millions more for the needless productions of other climates, would it not be well to consider, whether we cannot produce some of these exotic productions at home.

But whatever may be the opinion of our citizens as to the attempt to rival the European nations in horticulture, I think there can be none as to the communication of *the facts*—the real state of horticulture in Europe. If it shall appear, as it probably will, that half a century must pass away, before we can rival them—if it may be thought doubtful, whether at *any* future period we shall ever deem it proper or useful in a republican country, to imitate their extravagance on this subject, yet we hope and believe that we cannot be indifferent as to their success in the cultivation of plants common even at this day to them and to us.

There are many productions now common to them and to us. Surely it is interesting to us to know what the European gardeners have found to be useful in the cultivation of these plants. We know of no work in our country in which they would find a more proper place than in this journal. We have always considered the giving information in horticulture as a portion of our duties, and have devoted a very fair part of our journal to this topic.

Mr. Loudon, the author of the work which we introduce to the notice of our readers, has been for nearly twenty years well known as an author on the subject of gardening, in its most enlarged sense. His reputation is deservedly high, and his work is of a character far superior to those which have hitherto circulated in our country. Mawe's Gardener's Calendar, in its various editions, formed the ba-

sis of McMahon's, which in fact was little else than a transcript of the former, except that McMahon attempted to apply the British work to our own climate and seasons.

Still there was something wanting in the course of instruction in the art of horticulture. Mr. Loudon's work is, as it purports to be, a complete body of all the horticultural knowledge existing in England at the time of its publication.

Much of this work is not applicable to our country, and we presume, and hope never will be. Indeed it never can be until the *yeomanry* of this country shall be supplanted by purchase, or force, and a new class of rich proprietors substituted in their place. God grant that such a change may be postponed for many centuries. The parts of his work to which we advert, are, his dissertations on ornamental gardening on a *great* scale. It can scarcely be expected, and certainly it is not to be wished, that our small farms should be converted into parks for the pleasure and gratification of great proprietors. Our statutes of distribution of intestate estates, and the general, almost universal feeling of our opulent men present insuperable obstacles to this species of luxury. But, although we may not have a desire to see our country filled with ornamental grounds, formed at extravagant expense, yet we may reasonably desire to see our gardens well furnished and the art of horticulture carried to its highest degree of perfection—we may indeed indulge rationally the wish to see the markets of our cities furnished with the choicest and richest variety of exotic fruits—we may wish to see in our cities a taste for flowering plants of every climate—we know of no taste so innocent, and so accordant with a liberal and enlightened state of society.

Mr. Loudon's work is so expensive, that we can scarcely indulge the hope, that it will be reprinted in our country. We are indebted to the liberality of a friend for the opportunity we have of making extracts from it. No extracts,

however, can give a just idea of its value, because they must necessarily be very partial. To enable those who may wish to procure it we shall make some extracts, which, although they will contain many remarks, very familiar to all cultivators, will show how thoroughly he has digested every topic which relates to gardening.

We would not suggest that Mr. Loudon's work is to be compared with the admirable one of Philip Miller, (improved as it has been in the more recent editions,) but that work is too expensive, except for the most opulent. Mr. Loudon's book is only to be considered as an abbreviation of that *excellent work* and as an historical account of all the improvements which have been made since its last publication.

We shall give as a specimen of the manner in which the duty of a writer on universal gardening has been executed, an extract upon the apple tree, which is a subject of general interest in New England, and we may perhaps add some other articles if we have room for them.

“*Apple.—Pyrus Malus, L. (Eng. Bot. 179.) Icos. Di-Pentag. L. and Rosaceæ, J. Pomme, Fr. ; Apfel, Ger. ; and Pomo or Melo, Ital.*

“*The apple* is a spreading tree with the branches more horizontal than in the pear tree; the leaves ovate; the flowers in terminating umbels, produced from the wood of the former year; but more generally from very short shoots or spurs from wood of two years' growth. The fruit is roundish, umbilicate at the base, and of an acid flavor. In its wild state, it is termed the crab, and is then armed with thorns, with smaller leaves, flowers, and fruit, and the pulp of the latter extremely acid. It is a native of most countries of Europe in its wild state; and the improved varieties form an important branch of culture in Britain, France, Germany, and America, for the kitchen, the table, and for the manufacture of cider. From whence we at first re-

ceived the cultivated apple is unknown; but in all probability it was introduced by the Romans, to whom twenty-two varieties were known in Pliny's time (52), and afterwards the stock of varieties greatly increased at the Norman conquest. According to Stow, carp and pepins were brought into England by Mascal, who wrote on fruit trees in 1572. The apple-tree is supposed by some to attain a great age. Haller mentions some trees in Herefordshire that attained a thousand years, and were highly prolific; but Knight considers two hundred years as the ordinary duration of a healthy tree, grafted on a crab stock, and planted in a strong tenacious soil. Speechly (*Hints*, 58) mentions a tree in an orchard at Burton-joyce, near Nottingham, of about sixty years old, with branches extending from seven to nine yards round the bole, which, in 1792, produced upwards of 100 pecks of apples. Of all the different fruits which are produced in Britain, none can be brought to so high a degree of perfection, with so little trouble; and of no other are there so many excellent varieties in general cultivation, calculated for almost every soil, situation, and climate, which our island affords. Very good apples are grown in the Highlands and Orkneys, and even in the Shetland Isles, (*Caled. Hort. Mem.* vol. ii.) as well as in Devonshire and Cornwall; some sorts are ripe in the beginning of July, and others, which ripen later, will keep till June. Unlike other fruits, those which ripen latest are the best.

“*Use.* For pies, tarts, sauces, and the dessert, the use of the apple is familiar to every one. Duduit, of Mazères, has found that one-third of boiled apple-pulp, baked with two-thirds of flour, having been properly fermented with yeast for twelve hours, makes a very excellent bread, full of eyes, and extremely palatable and light. (*New Month. Mag.* June 1821.) The fermented juice forms cider, a substitute both for grape-wine and malt liquor. In confectionary, it is used for comfits, *compotes*, marmalades,

ellies, pastes, tarts, &c. In medicine, verjuice, or the juice of crabs, is used for sprains, and as an astringent and repellent: and, with a proper addition of sugar, Withering thinks a very grateful liquor might be made with it, little inferior to Rhenish wine. Lightfoot affirms that the crab mixed with cultivated apples, or even alone, if thoroughly ripe, will make a sound, masculine wine. The apple, when ripe, is laxative; the juice is excellent in dysentery: boiled or roasted apples fortify a weak stomach. Scopoli recovered from a weakness of the stomach and indigestion from using them; and they are equally efficacious in putrid and malignant fevers with the juice of lemons or currants. In perfumery, the pulp of apples, beat up with lard, forms pomatum: and Bosc observes (*N. Cours d' Agriculture, &c. in loco,*) that the prolonged stratification of apples with elder-flowers, in a close vessel, gives the former an odor of musk extremely agreeable. In dyeing, the bark produces a yellow colour; and, in general economy, the wood of the tree is used for turning, and various purposes, where hardness, compactness, and variegation of colour, are objects.

“*Criterion of a good apple.* Apples for the table are characterised by a firm juicy pulp, elevated poignant flavour, regular form, and beautiful colouring; those for kitchen use, by the property of falling, as it is technically termed, or forming in general a pulpy mass of equal consistency, when baked or boiled, and by a large size. Some sorts of apples have the property of falling when green, as the Keswick, Carlisle, Hawthornden, and other codlins; and some only after being ripe, as the russet tribes. Those which have this property when green, are particularly valuable for affording sauces to geese early in the season, and for succeeding the gooseberry in tarts. For cider, an apple must possess a considerable degree of astringency, with or without firmness of pulp, or richness of juice. The best kinds, Knight observes, are often tough, dry, and fibrous; and the Siberian Harvey, which he recommends as one

of the very best cider apples, is unfit either for culinary purposes or the table. Knight has found that the specific gravity of the juice of any apple recently expressed, indicates, with very considerable accuracy, the strength of the future cider. Considering the various uses of the apple, we agree with Speechly in regarding it as a fruit "of more use and benefit to the public in general, than all the other fruits, the produce of this island, united."

"*Varieties.* Tusser, in 1573, mentions in his list of fruits, "apples of all sorts." Parkinson, in 1629, enumerates fifty-seven sorts. Evelyn, about thirty years afterwards, says, (*Pomona*, pref.) "It was through the plain industry of one Harris, a fruiterer to Henry VIII., that the fields and environs of about thirty towns in Kent only, were planted with fruit from Flanders, to the universal benefit and general improvement of the country." Gibson (*Churches of Dove and Homelacy,*) mentions that Lord Scudamore, ambassador to the court of France, in the time of Charles I., collected in Normandy scions of cider-apple-trees, and when he returned to England, encouraged the grafting them throughout the county of Hereford. Hartlib, in 1650, speaks of "one who had two hundred sorts of apples," and "verily believes there are nearly 500 sorts in this island." Ray, in 1688, selected from the information of the most skilful gardeners about London, a list of 78 sorts. Succeeding writers have been enabled greatly to increase the list, partly from the almost continual accession of sorts received from the continent during intervals of peace, but principally from the great numbers raised from seeds. A variety of apple, like those of most other plants, is supposed by some to have only a limited duration; and hence on taking a retrospective view of the lists of sorts, given by Parkinson, Evelyn, and other authors, many of them are not now to be found, or are so degenerated or diseased, as no longer to deserve the attention of the planter. "The moil," Knight observes, "and its successful ri-

val, the red streak, with the musts and golden pippin, are in the last stage of decay, and the stire and foxwhelp are hastening rapidly after them." After making a great variety of experiments for several years, and after many attempts to propagate every old variety of the apple, this author observes (*Tr. on Apple and Pear*, 15.) "I think I am justified in the conclusion, that all plants of this species, however propagated from the same stock, partake in some degree of the same life, and will attend the progress of that life, in the habits of its youth, its maturity, and its decay; though they will not be any way affected by any incidental injuries the parent tree may sustain after they are detached from it."

"Knight next directed his attention to raising new varieties from seeds, and has, by crossing one sort with another, and by having constantly several thousands of seedlings rearing, from which, as they show fruit, to select the best sorts, succeeded in producing several new varieties of apples, much esteemed for the table and the press. Of several of these sorts, and how obtained, accounts will be found in the work above quoted, and in the *Horticultural Transactions*. Several eminent horticulturists, in different districts, are now engaged in a similar manner; and there can be little doubt a valuable accession will, in a few years, be made to this class of fruits. Some, however, as Williamson (*Hort. Trans.* iii. 291.) and Speechly (*Hints.* 188.,) consider that the deterioration of the apple and other fruits may be owing to the climate, and that the return of genial summers would restore to us from old trees as good fruit as heretofore. Such also is our opinion, and Knight's doctrine appears to us contrary to general analogy in vegetable life. It is unquestionably true that all varieties have a tendency to degenerate into the primitive character of the species: but to us it appears equally true, that any variety may be perpetuated with all its excellencies by proper culture, and more especially varieties of trees. However unsuccessful

Knight may have been in continuing the moil, redstreak, and golden pippin, we cannot alter our conviction, that by grafting from these sorts they may be continued, such as they are, or were when the scions were taken from the trees, to the end of time. As to plants propagated by extension, "partaking in some degree of the same period of life as the parent," we cannot admit the idea as at all probable. Vines, olives, poplars, and willows have been propagated by extension for ages, and are still, as far as can be ascertained, as vigorous as they were in the time of Noah or Pliny.*

"*A numerous list of varieties may be considered as puzzling to inexperienced persons who have to select for a garden or an orchard.* Sabine (*Hort. Trans.* iii. 263.) justly observes, that the stock of apples requires reduction rather than increase; and adds, that one of the chief objects to which the attention of the Horticultural Society is at present directed, is to make a judicious selection.

"*A great variety of apple-trees in a bearing state may be seen in different nurseries both in Britain and Ireland, but especially near London;* from these in the autumn, the fruit may be tasted from the trees, and either young plants newly worked, or plants in a state of bearing, fixed on and marked, to be taken up at the proper season. The advantages of this mode, especially to such as possess but a small garden, are too obvious to require comment.

"*Propagation.* The apple, like most other hardy trees, may be propagated by seeds, cuttings, suckers, layers, or engrafting; by seeds, for obtaining new varieties, and by the other modes for continuing such as are in esteem.

"*By seeds.* The first business here is, the choice of the seeds; which should be taken from fruits, having the properties it is desired to perpetuate or improve in the greatest degree. The sorts of apples proper for crossing or reciprocal impregnation, appear to be those which have

* We differ from Mr. Loudon on this point.—*Editor.*

a great many qualities in common, and some different qualities. Thus the golden pippin has been crossed by other pippins or rennets, and not by calvils or codlings. A small sized apple, crossed by a large sort, will be more certain of producing a new variety than the above mode; but will be almost equally certain of producing a variety destitute of valuable qualities; the qualities of parents of so opposite natures being, as it were, cruelly jumbled together in the offspring.

"*Knight's mode* of cutting out the stamens of the blossom to be impregnated, and afterwards, when the stigma is mature, introducing the pollen of the other parent, is unquestionably the most scientific mode of performing the operation. In this way he produced those excellent apples, the Downton, red and yellow Ingeshire, and Grange pippins, from the same parents; viz., the seed of the orange pippin, and the pollen of the golden pippin. The Brindgwood pippin he produced from golden pippin blossoms (divested of their stamens) dusted with the pollen of the golden harvey apple. The seeds may be sown in autumn, in light earth, covered an inch, and either in pots or beds. The end of the first year they should be transplanted into nursery rows, from six inches to a foot apart every way. Afterwards they should be removed to where they are to produce fruit; and for this purpose the greater the distance between the plants the better. It should not be less than six or eight feet every way. The quickest way to bring them into a bearing state, Williams, of Pitmaston, considers, (*Hort. Trans.* vol. i. 333.) is to let the plants be furnished with lateral shoots from the ground upwards; so disposed as that the leaves of the upper shoots may not shade those situated underneath, pruning away only trifling shoots. This mode of treatment occurred to him on reflecting on *Knight's Theory of the Circulation of the Sap.* Observing, the change in the appearance of the leaves of his seedling plants as the trees advanced in growth, he thought it might

be possible to hasten the progress of the plants, and procure that peculiar organization of the leaf, necessary to the formation of blossom buds, at a much earlier age. He in consequence adopted the mode above described, and succeeded in procuring fruit from seedling apples at four, five, and six years of age, instead of waiting eight, ten, and even fifteen years, which must be the case by the usual mode of planting close, and pruning to naked stems.

"*Macdonald*, an eminent Scotch horticulturist, has also succeeded in obtaining fruit from seedlings at an early period by grafting, already stated as one of the uses of that mode of propagation. In 1808, he selected some blossoms of the nonpareil, which he impregnated with the pollen of the golden pippin and of the Newton pippin. When the apples were fully ripe, he selected some of the best, from which he took the seeds, and sowed them in pots, which he placed in a frame. He had eight or nine seedlings, which he transplanted into the open ground, in spring 1809. In 1811, he picked out a few of the strongest plants, and put them singly into pots. In spring 1812, he observed one of the plants showing fruit buds. He took a few of the twigs, and grafted them on a healthy stock on a wall; and in 1813 he had a few apples. This year (1816) his seedlings yielded several dozens, and also his grafts; and he mentions that the apples from the grafts are the largest. He is of opinion that in giving names to seedlings, raised in Scotland, the word 'Scotch' should be mentioned.

"*A very common practice among those who raise fruit trees from seed*, is, in the second or third season, to select such plants only as have broad and roundish leaves, throwing away the rest; experience having taught, that the former more frequently produce fruit of improved qualities, or at least larger, than those plants which have narrow pointed leaves. The width and thickness of the leaf, Knight observes, 'generally indicates the size of the future apple; but will by no means convey any correct idea

of the merits of the future fruit. Where these have the character of high cultivation, the qualities of the fruit will be far removed from those of the native species ; but the apple may be insipid or highly flavoured, green, or deeply coloured, and of course well or ill calculated to answer the purposes of the planter. An early blossom in the spring, and an early change of colour in the autumnal leaf, would naturally be supposed to indicate a fruit of early maturity ; but I have never been able to discover any criterion of this kind on which the smallest dependence may be placed. The leaves of some varieties will become yellow and fall off, leaving the fruit green and immature ; and the leaves in other kinds will retain their verdure long after the fruit has perished. The plants whose buds in the annual wood are full and prominent, are usually more productive than those whose buds are small and shrunk in the bark ; but their future produce will depend much on the power the blossoms possess of bearing the cold, and this power varies in the different varieties, and can only be known from experience. Those which produce their leaves and blossoms rather early in the spring are generally to be preferred, for though they are more exposed to injury from frost, they less frequently suffer from the attacks of insects ; the more common cause of failure. The disposition to vegetate early or late in the spring, is, like almost every other quality in the apple-tree, transferred in different degrees to its offspring ; and the planter must therefore seek those qualities in the parent tree which he wishes to find in the future seedling plants. The most effective method I have been able to discover of obtaining such fruits as vegetate very early in the spring, has been by introducing the farina of the Siberian crab into the blossoms of a rich and early apple, and by transferring in the same manner the farina of the apple to the blossom of the Siberian crab. The leaf and the habit of many of the plants, that I have thus obtained, possess much of the character of the apple, whilst

they vegetate as early in the spring as the crab of Siberia, and possess, at least, an equal power of bearing cold; and I possess two plants of this family, which are quite as hardy as the most austere crab of our woods.'

"*Abercrombie* observes that, 'as the codling is a sort found to change very little from seed, or not for the worse, new plants of it are sometimes raised by sowing the kernels, not by way of experiment for a new uncertain variety, but with some dependence on having a good sort resembling the parent.'

"*By cuttings.* Every variety of apple may be grown from cuttings; though some with much greater facility than others. All those of the burknott and codling tribes grow as well this way as by any other, and some allege that the trees so raised are not liable to canker (*Hort. Trans.* vol. i. p. 120.,) which is supposed to be owing to their 'putting out no tap-root, but spreading their numerous fibres from the knot or burr horizontally.' Even the golden pippin may be continued in this way, and the trees have remained seven years in perfect health, when grafts taken not only from the same tree, but from the very branch, part of which was divided into cuttings, cankered in two or three years. 'All apple-trees raised in this way,' Biggs observes, 'from healthy one-year-old branches, with blossom buds upon them, will continue to go on bearing the finest fruit, in a small compass, for many years. Such trees are peculiarly proper for forcing, and not liable to canker.' (*Hort. Trans.* vol. i. p. 65.) The cuttings are to be chosen from the young wood of horizontal or oblique branches, rather than from upright ones; from six to eight inches or more in length, with a small portion of old wood at the lower end. Cut off the tip of the shoot, and all the buds, excepting two or three next the tip or upper extremity; then smooth the sections at the lower end, and insert them three or four inches in sandy loam, pressing the earth firmly to them, watering, and covering with a hand-glass. The

proper time for this operation is early in February, and the glass should not be touched, excepting to give water, till the shoots have sprung an inch or two. Shade during the mid-day sun, and begin to harden by giving air in July; finally remove the glass in August; and in October transplant to nursery rows, or in pots, according to future intention. With the burknott tribe, all that is necessary is to plant the cuttings in a shady border, and treat them like those of the gooseberry or currant.

“*By layers.* The success of this mode of propagation may be considered as certain; as it has nothing peculiar in its application to the apple, we need only refer to general directions for performing the operation. The after treatment of the plants is the same with that for those originated by the foregoing or following modes.

“*By suckers.* This mode is generally confined to the paradise and creeping apple for stocks.

“*By grafting and inoculation.* This may be said to be the universal practice in propagating the apple. The first consideration is the choice of stocks; of these there are five sorts in common use:—*Seedling apples*, used for full standards, and riders or wall standards; *seedling crabs*, for standards and half standards; *codling apples*, from layers or cuttings, for dwarfs and espaliers; *paradise apples*, or *doucins*, from layers or cuttings, for low dwarfs and trained; and *creeper apples*, from layers or cuttings, for the best dwarfs or bushes. Dubreuil, gardener at Rouen, recommends the doucin for clayey and light soils, and a free stock for such as are chalky and siliceous. (*Hort. Trans.* iv. 566.)

“*Stocks of seedling apples.* The seeds should be selected from the fruit of vigorous growing young or middle-aged healthy trees; but when wanted in large quantities, they are procured from cider makers; private propagators will adopt the first mode. The sowing and after treatment is the same as for seedling crabs.

“*Seedling crabs.* ‘A preference,’ Knight observes, ‘has

generally and justly been given to apple-stocks raised from the seeds of the native kind, or crab, as being more hardy and durable than those produced from the apple. The offspring of some varieties of the crab, particularly of those introduced from Siberia, vegetate much earlier in the spring than the other trees of the same species; and thence the inexperienced planter will probably be led to suppose, that such stocks would accelerate the vegetation of other varieties in the spring, and tend to produce an early maturity of the fruit in autumn. In this, however, he will be disappointed. The office of the stock is, in every sense of the word, subservient; and it acts only in obedience to the impulse it receives from the branches: the only qualities, therefore, which are wanting to form a perfect stock, are vigour and hardiness.

“Seeds, sowing, and culture. In recollecting the seeds to sow, it must be remembered that the habits as well as the diseases of plants are often hereditary, and attention should be paid to the state of the tree from which the seeds are taken; it should be large and of free growth, and rather in a growing state than one of maturity or decay. The crab trees, which stand in cultivated grounds, generally grow more freely and attain a larger stature than those in the woods, and therefore appear to claim a preference. The seeds should be taken from the fruit before it is ground for vinegar, and sown in beds of good mould an inch deep. From these the plants should be removed in the following autumn to the nursery, and planted in rows at three feet distance from each other, and eighteen inches between each plant. Being here properly protected from cattle and hares, they may remain till they become large enough to be planted out; the ground being regularly worked and kept free from weeds.

“Codling stocks are raised chiefly from layers, which, at the end of the season, are taken off and planted in nursery

rows two feet between the rows, and one foot plant from plant.

"*Paradise*, or as they are called by the French, *doucins stocks*, are raised either from layers or suckers; and stocks from *creeping apples* (so named from their aptitude to throw up suckers,) or the *Dutch paradise*, chiefly from the latter mode. They may be planted in nursery rows somewhat closer than the codling stocks.

"*All stocks* require to stand in the nursery till they are from half an inch to an inch thick, at the height at which they are to be grafted; such as are intended for full standards or riders will, in general, require to grow three or four years before being fit for this operation; those for half standards two years, and those for dwarfs one year. The ground between them must be kept clear of weeds, and stirred every winter; the side shoots of the plants, at least to the height at which they are intended to be grafted, rubbed off as they appear, and all suckers carefully removed. Where budding is adopted, the stocks may be worked at nearly half the diameter of stem requisite for grafting; and stocks for dwarfs planted in autumn or spring may be inoculated the succeeding summer. No great advantage, however, is gained by this practice, as such plants require to stand at least another year, before they have produced their bud-shoots.

"*Soil and situation of the nursery.* A difference of opinion appears always to have prevailed respecting the quality of the soil proper for a nursery; some have preferred a very poor, and others a very rich soil; and both perhaps are almost equally wrong. The advocates for a poor soil appear to me to have been misled by transferring the feelings of animals to plants, and inferring that a change from want to abundance must be agreeable and beneficial to both. But plants in a very poor soil become stunted and unhealthy, and do not readily acquire habits of vigorous growth, when removed from it. In a soil which has been

highly manured, the growth of young apple-trees is extremely rapid; and their appearance, during two or three years, generally indicates the utmost exuberance of health and vigor. These are, however, usually the forerunners of disease, and the ‘canker’s desolating tooth’ blasts the hopes of the planter. In choosing the situation for a nursery, too much shelter, or exposure, should be equally avoided; and a soil, nearly similar to that in which the trees are afterwards to grow, should be selected, where it can be obtained. Pasture ground, or unmanured meadow, should be preferred to old tillage, and a loam of moderate strength and of considerable depth to all other soils.’ (*Tr. on App. and Pear.*)

“*Grafting.* The first business is to select the scions, the principles of which have been already noticed. At whatever seasons scions are to be inserted, Knight observes, ‘the branches, which are to form them, should be taken from the parent stock during the winter, and not later than the end of the preceding year: for if the buds have begun to vegetate in the smallest degree, and they begin with the increasing influence of the sun, the vigour of the shoots, during the first season, will be diminished, and the grafts will not succeed with equal certainty; though a graft of the apple-tree very rarely fails, unless by accidental injury, or great want of skill in the operator. The amputated branches must be kept alive till wanted, by having the end of each planted in the ground, a few inches deep in a shady situation.’

“*Stocks destined to form standard trees,* may either be grafted at the usual height at which the lateral branches are allowed to diverge, which is commonly six feet, or they may be grafted near the ground, and a single shoot trained from the graft, so as to form the stem of the tree. The propriety of grafting near the ground, or at the height of six or seven feet, will depend on the kind of fruit to be propagated, whether it be quite new and just beginning to bear,

or a middle-aged variety. In new and luxuriant varieties, and these only should be propagated, it will be advantageous to graft when the stocks are three years old, as the growth of such will be more rapid, smooth, and upright than that of the crab, and there will be no danger of these being injured by beginning to bear too early. Middle-aged varieties will be most successfully propagated by planting stocks of six or seven foot high, and letting them remain ungrafted till they become firmly rooted in the places in which the trees are to stand. One graft only should be inserted in each stock ; for when more are used, they are apt to divide when loaded with fruit, and to cleave the stock, having no natural bond or connection with each other. When the stocks are too large for a single scion, I would recommend that the grafts be inserted in the branches, and not in the principal stem. This practice is not uncommon in various parts of England ; and is general in Germany, with free stocks, where, however, they often neglect to graft the trees ; and thus, as Neill observes, produce an endless variety of sorts, some good, but most of them a little better than crabs.

"*Stocks intended to form half standards,* are grafted at three or four feet from the ground ; and those for *dwarfs* at eight or ten inches, or lower. Miller and Knight agree in recommending to graft near the ground where lasting and vigorous trees are wanted ; but the practice of the continental gardeners, and the opinions of some in this country, are in favour of leaving a stem below the graft of not less than a foot in length.

"*The kind of grafting generally adopted* for moderate sized stocks is the *whip* or *tongue* method or the new mode of saddle-grafting adopted by Knight ; and the general time for the apple is the end of February and greater part of March. Much depends on the season and situation ; the guiding principle is, to make choice of the time when the sap of the stock is in full motion ; while that

of the scions, from having been previously cut off and placed in the shade, is less so.

"*The common season for budding the apple* is July; as there is nothing peculiar to this tree in performing that operation, we refer to the general directions.

"*Transplanting grafted trees in the nursery.* 'It has been recommended,' Knight observes, 'to remove grafted trees once or twice during the time they remain in the nursery, under the idea of increasing the number of their roots; but I think this practice only eligible with trees which do not readily grow when transplanted. I have always found the growth of young apple-trees to be much retarded, and a premature disposition to blossom to be brought on by it; and I could not afterwards observe that those trees, which had been twice removed, grew better than others. It has also been supposed that many small roots, proceeding immediately from the trunk, are, in the future growth of the tree, to be preferred to a few which are large; but as the large roots of necessity branch into small, which consequently extend to a greater distance, the advantages of more transplantations than from the seed-bed to the nursery, and thence to the garden or orchard, may reasonably be questioned.'

"*Other sources of choice.* Another source of choice, under each of the above heads, may respect the soil, situation, and climate of the garden, or orchard, in which they are to be planted, or the character, whether of dwarfs, espaliers, or wall-trees, which they are to assume there. The winter and spring table apples may require a south wall in one district, while in another they may attain equal maturity as standards or espaliers. Where there is ample room, a selection of large sorts, as the Alexander and Baltimore apples, or of such as are the most beautifully coloured, as the violet, carnation, &c. may be made to gratify the eye; where room is wanting, useful sorts and great bearers are to be preferred, as the golden and ribstone pippin, summer

pearmain, codlings, grey russet, summer and winter colvilles, &c. In general, small-sized fruit, as the Harveys and Granges, are to be preferred for standards, as less likely to break down the branches of the trees, or be shaken down by winds; middling sorts for walls and dwarfs, and the largest of all for espaliers. In respect to a soil liable to produce canker, sorts raised from cuttings may be desirable, as the Burknott and codling tribe; and where an occupier of a garden has only a short interest therein, such as come into immediate bearing, as the Burknotts, and others from cuttings, and the Hawthorndean, Apis's apple, and other short-lived dwarf-sorts on Paradise or creeping stocks, may deserve the preference. On the contrary, where a plantation is made on freehold property, or with a view to posterity, new varieties on crab or free stocks, should always be chosen, as the Grange, Ingistrie, Harvey, &c. Some excellent sorts will grow and produce crops every where, as the Hawthorndean, codling, and Ribston pippin; the latter of which, Nicol says, will grow at John o'Groat's house, and may be planted in Cornwall; others are shy bearers in cold situations, as the Newtown pippin of America, and most of the newly imported French sorts.

“Choice of plants and planting. This depends in some degree on the object in view, the richness of the soil, and the shelter; young trees are more likely to succeed in exposed sites and poor soils, but the apple will bear transplanting at a greater age than any other fruit-tree. It may be planted in any open weather from November till February.

“Soil and site for permanent planting. Any common soil, neither extremely sandy, gravelly, nor clayey, on a dry sub-soil, and with a free exposure, will suit this tree. On wet, hilly sub-soils, it will do no good, but after being planted a few years will become cankered, and get covered with moss. Where fruit trees must be planted on such soils, they should first be rendered as dry as possible by underdraining; next, provision made for carrying off the rain-

water by surface gutters; and, lastly, the ground should not be trenched above a foot deep, and the trees planted rather in hillocks of earth, above the surface, than in pits dug into it. There is no point of more importance than shallow trenching and shallow planting in cold wet soils, in which deep pits and deep pulverisation only serve to aggravate their natural evils of moisture and cold. (*Sang, in Caled. Hort. Mem.* iv. 140.)

“*Knight* observes, that ‘the apple-tree attains its largest stature in a deep strong loam or marly clay; but it will thrive in all rich soils, which are neither very sandy nor wet at bottom. It succeeds best,’ he adds, ‘in situations which are neither high nor remarkably low. In the former its blossoms are frequently injured by cold winds, and in the latter by spring frosts, particularly when the trees are planted in the lowest part of a confined valley. A south, or south-east aspect is generally preferred, on account of the turbulence of the west, and the coldness of north winds; but orchards succeed well in all aspects; and where the violence of the west wind is broken by an intervening rise of ground, a south-west aspect will be found equal to any.’

“*Abercrombie* says, ‘all the sorts of apple-tree may be planted in any good common soil, with a free exposure, whether that of a garden, orchard, or field; so that the ground be neither very low nor excessively wet, nor subject to inundation in winter. Avoid, as far as possible, very strong clayey and gravelly soils.’

“*Mode of bearing.* ‘In all the varieties of the common apple, the mode of bearing is upon small terminal and lateral spurs, or short robust shoots, from half an inch to two inches long, which spring from the younger branches of two or more years’ growth, appearing first at the extremity, and extending gradually down the side: the same bearing branches and fruit-spurs continue many years fruitful.’ (*Abercrombie.*)

“*Pruning.* ‘As, from the mode of bearing, apple-trees

do not admit of shortening in the general bearers, it should only be practised occasionally : first, where any extend out of limits, or grow irregular and deformed ; and secondly, a good shoot contiguous to a vacant space is shortened to a few eyes, to obtain an additional supply of young wood from the lower buds of the shoot for filling up the vacancy. But to shorten without such a motive, is not merely the cutting away of the first and the principal bearing part of the branches, but also occasions their putting forth many strong useless wood-shoots where fruit-spurs would otherwise arise ; and both effects greatly tend to retard the trees in bearing ; whereas the fertile branches being cultivated to their natural length, shoot moderately, and have fruit-spurs quite to the extremity.' (*Abercrombie.*)

"*Espaliers and wall-trees* require a summer and winter pruning.

"*The summer pruning.* Train in the young shoots of the same year, which are likely to be wanted in the figure, and retrench them where ill placed or too numerous ; for as the trees continue bearing many years on the same branches, they only require occasional supplies of young wood ; therefore, begin in May or June to pinch off or cut out close all fore-right, ill-placed, and superfluous shoots ; retaining only some of the promising laterals in the more vacant parts, with a leader to each branch ; train in these between the mother branches, at their full length, all summer ; or, where any vacancy occurs, some strong contiguous shoot may be shortened in June to a few eyes, to furnish several laterals the same season. Keep the shoots in all parts closely trained, both to preserve the regularity of the espalier, and to admit the air and sun to the advancing fruit.

"*The winter pruning* may be performed from November till the beginning of April. This comprehends the regulation of the wood-branches, the bearers, and of the young shoots. First, examine the new shoots trained in the preceding summer ; and if too abundant, retain only a compe-

tency of well placed and promising laterals, to furnish vacant parts, with a leading shoot to each parent branch. Continue these mostly at full length, as far as there is room. Cut out close the superabundant and irregular young shoots; and where any of the elder branches appear unfruitful, cankery or decayed, cut them either clean out, or prune short to some good lateral, as may seem expedient. Also prune into order any branches which are very irregular, or too extended. Carefully preserve all the eligible natural fruit spurs; but remove all unfruitful stumps and snags, and large projecting rugged spurs; cutting close to the old wood. As each espalier is pruned, let the old and new branches be laid in at convenient distances, according to the size of the fruit, four, five, or six inches asunder, and neatly tied or nailed to the wall or trellis. (*Abercrombie.*)

Training espaliers. The following mode, as described by Mearns, is the most general, and by using stakes, which do not answer so well for any other species of espalier-tree as for apples, is also the most economical:—In the first stage of training, the stakes require to stand as close together as twelve or fourteen inches, and to be arranged in regular order to the full height of five feet, with a rail slightly fastened on the top of them for neatness' sake, as well as to steady them. If stakes of small ash, Spanish chesnut, or the like, from coppices or thinnings of young plantations, be used, they will last for three or four years, provided they are from one inch and a half to two inches in diameter, at a foot from the bottom. They need not be extended further in the first instance than the distance to be considered probable the trees may reach in three years' growth; at that period, or the following season, they will all require to be renewed, and the new ones may be placed on each side, to the extent that the trees may be thought to require while these stakes last, finishing the top as before, with a rail. As the trees extend their horizontal branches, and acquire substance, the two stakes on each side of the one that supports

the centre leader of the tree, can be spared, and removed to any of the extremities where wanted. And as the tree extends further, and acquires more substance, every other stake will be found sufficient; and the centre stake can be spared also, after the leader has reached its destined height, and is of a sufficient substance to support itself erect. When such a form of training is completed, and the branches of sufficient magnitude, about six, eight, or twelve stakes will be sufficient for the support of the horizontal branches, even when they have the burden of a full crop of fruit. At any other time about six stakes to each tree will be all that are necessary.

"In selecting trees for the usual horizontal training, look out for those which have three fine shoots. Or it is better to plant them one year where they are to remain to get their roots well established, and then to head them down to within eight or nine inches of the ground, and to encourage three shoots from the top of each stool, so that the first and lowermost horizontal shoots may be tied down within ten inches of the ground."

"In the pruning season cut down the middle shoot of the three, reserving what is left as an upright leader, its length being about twelve inches from the base of the other two, and train these in a horizontal position, fixing the middle shoot, which was cut down perpendicularly to the stake it is planted against. But if it is against a wall or pales, it may be better to zigzag the upright leader, for the more regular distribution of the sap, and when that is intended, the leader should be left a little longer, to allow of its being bent. In espalier training this zigzagging is not so readily done, nor is it necessary where the trees are not intended to rise high. It is always necessary, in the course of training the young wood across the stakes, in summer, to have large osier, or similar rods, to tie them to, in order to guide the shoots of the year in a proper direction. The proper ties are small osier twigs.

"*The following summer* encourage three other shoots in the same way as the season before, then cut off the middle shoot at ten, twelve, or fifteen inches above the base of the other two, and train these last as in the former season; and so continue training, year after year, till the trees have reached their destined height. (*Mearns in Hort. Trans.* v. 46.) An improvement on this mode consists in cutting down the leading shoot during summer, in the manner practised by Harrison, of Wortley Hall, as described in the succeeding paragraphs.

Training against a wall. The horizontal mode is unquestionably to be preferred for so vigorous a growing tree as the apple; and Harrison's mode of conducting the process (*Tr. on Fruit-Trees, 1823. ch. xx.*) appears to us much the best. The peculiarity of his method is, that instead of training the leading shoot in a serpentine or zigzag manner with Hitt or Mearns, to make it send out side shoots, he adopts the much more simple and effectual mode of cutting down the current year's shoots in June; by which means he gains annually a year, as side shoots are produced on the young wood of that year, as well as on last year's wood which it sprang from.

"*The tree being a maiden plant* is the first year headed down to seven buds. Every bud pushing, two of the shoots, the third and fourth, counting upwards, must be rubbed off when they are three inches in length; the uppermost shoot must be trained straight up the wall for a leading stem, and the remaining four horizontally along the wall. The leading shoot having attained about fifteen inches in length, cut it down to eleven inches. From the shoots that will thus be produced select three, one to be trained as a leader, and two as side branches. Proceeding in this way for seven years, the tree will have reached the top of a wall twelve feet high. With weak trees, or trees in very cold late situations, this practice will not be advisable, as the wood produced would be too weak, or would not ripen; but in all

ordinary situations, it is obviously a superior mode to any that has been hitherto described in books. In pruning the spurs of apple and other trees, Harrison differs from many gardeners in keeping them short, never allowing one spur to have more than three or four fruit-buds, and in cutting off the spurs entirely, or cutting them down for renewal every fourth or fifth year. Every practical gardener, desirous of excelling in the training and spurring of fruit-trees, ought to possess Harrison's treatise.

"*Heading down* apple-trees that are much cankered, is strongly recommended by Forsyth, who gives an example of one, after it had been headed down four years, which bore plenty of fine fruit. The point at which it was headed down was within eighteen inches of the soil; and under it, on the stump, were two large wounds and made by cutting out the cankery part, and which being covered with the composition were soon nearly filled up with sound wood. Very little pruning is at first given to trees so cut, but afterwards a regular succession of bearing wood is kept up by removing such as have borne for three or four years. Thus, one branch which has done bearing, is cut off, and succeeded by another, and when that is tried also, it is cut off, and replaced by a third, and so on.

"*Grafting old apple trees* of different sorts with superior varieties, is an obvious and long-tried improvement. In this case, if the tree is a standard, it is only headed down to standard height; in old subjects, most commonly the branches only are cut over within a foot or two of the trunk, and then grafted in the crown or cleft manner.

"*Injuries, insects, &c.* The mistletoe (*Viscum album*) is frequently, through negligence, suffered to injure trees in orchards, and different species of mosses and lichens those in gardens. 'Moss,' Knight observes, 'appears to constitute a symptomatic, rather than a primary, disease in fruit trees: it is often brought on by a damp or uncultivated soil, by the age of the variety of fruit, and by the want of air

and light in closely planted unpruned orchards. In these cases it can only be destroyed by removing the cause to which it owes its existence.'

"*Blights.* Whatever deranges and destroys the organization of the blossom, and prevents the setting of the fruit, is in general termed a blight; whether produced by insects, parasitical plants, or an excess of heat or cold, drought or moisture. One of the most injurious insects with which the apple-tree has been visited for the last twenty years, is the *Aphis lanigera*, L., the *Eriosoma mali* of Leach; woolly aphid, apple-bug, or American blight. 'The eriosomata,' Leach observes, 'form what are called improperly galls on the stalks of trees, near their joints and knobs, which are in fact excrescences, caused by the efforts of nature, to repair the damage done to the old trees by the perforation of those insects whose bodies are covered with down.' (*Sam. Ent.*) Salisbury has given an engraving of the eriosoma as he found it appear under a magnifying glass, when attacking the roots and the branches, as well as a still more highly magnified figure of one of the bugs without wings and winged. The latter he considers likely to be the male insect. Thoroughly cleaning with a brush and water, together with amputation when it has been some time at work, is the only means of destroying this insect; but even this will not do, unless resorted to at an early stage of its progress. The caterpillars of many species of butterfly and moth, and the larvæ of various other genera of the *hemiptera* and *lepidoptera*, &c. as *Scarabæus*, *Cuculi*, &c. attack the apple-tree in common with other fruit-trees; and on a large scale it is difficult, if not impracticable, to avoid their injurious effects. Burning straw or other materials under the trees has been long recommended; but the principal thing to be relied on, in our opinion, is regimen; that is, judicious sub-soil and surface-soil, culture, and pruning."

It would be improper for us to quit the subject of Mr. Loudon's book without expressing some qualifying thoughts.

Mr. Loudon is professedly but a compiler;—there is little if any thing new in his book, though it comprises the substance of a large number of works. It is not well fitted for the general mass of readers, and those who have furnished libraries will have little use for it, except as a convenient book of reference. Much, at least one half of the work, is not in any degree applicable to our country. Still Mr. Loudon's work is curious, and interesting, inasmuch as it shows what Great Britain is—the state of luxury, which prevails in the most expensive of all modes in which exorbitant wealth seeks to disburden itself.

There are defects in Mr. Loudon's work. There is too much parade of learning, much more than a truly learned man would make. Some topics seem to have been introduced solely with a view to effect—to create surprize. For example, there is either too much or too little on the subject of insects—there is a very silly play upon words, a disposition to be witty, when the author introduces among the injurious *insects, men*, who steal the fruit itself instead of consuming it. There are many insects enumerated which do but little if any injury, and a great number highly injurious which are omitted.

Mr. Loudon's book is however one which we should covet, and which we mean to own. It is very much, like all Encyclopedias, not calculated for practical men, who intend to be masters of any science, but for the curious, who wish to know something of every art.

THE SILK WORM AND ITS NATURAL FOOD THE MULBERRY.

IN the present state of our country, and while it is a debateable question, whether it would be expedient to introduce the silk worm, and its favourite food, the mulberry, into general cultivation, it would be inexpedient to insert the

great mass of information which has been collected on this subject by European writers.

In favour of the introduction of this department of industry may be urged, the great demand for manufactures of silk, for which we now pay to other nations seven millions of dollars—the advantage derived from the domestic employment of *females*, who, until the introduction of cotton manufactories, were in our country less employed than in any other—and the opportunities which it would afford of making even the young children of both sexes useful, before the ages at which they would be fitted for any sort of labour in husbandry. These are considerations of great importance.

We should indeed regret to see our females and young children employed, as in most European countries they are compelled to be, in labour, unsuited to their condition and constitutions. Such employment would soon change their moral and physical character, upon which the happiness of our population, and the stability of our republican institutions principally repose.

Yet employment, occupation, not inconsistent with the cultivation of the mind, or the strengthening and developement of the bodily powers, is of great value and of the highest importance. There can be no doubt that much time is unnecessarily lost in all our cities and in the country during the years of childhood, which might be profitably employed by occupations which would strengthen both the body and the mind. The instruction of the young is principally given in the winter season, and in the summer the children are too often left without any useful employment.

The care of the silk worm—the collection of leaves for its food, could be entirely managed by children from 5 to 12 years of age, under the eye of a mother or an elder sister.

As the *quantity* of land required for the cultivation of the

mulberry plants, (for we must not call them trees, since they are not permitted to grow beyond the size of shrubs,) may be considered literally as of no value in the estimate; and as all the gain which the farmer would derive from the sale of his silk would be merely the result of labour, which is now wholly unproductive, it seems to be a very clear case that we should encourage this culture.

It can scarcely be necessary to reply to an objection which is sometimes urged, that silk manufactures are a luxury which our republican simplicity ought to reject, which are not a necessary of life. The fact that we do pay for them an amount equal to one-tenth part of all our exports is a sufficient reply. No sumptuary laws can check this luxury, if it be one. There is no intermediate point at which you can stop, between the clothing with furs prepared from the wild beasts, and the going nearly naked in the warm season, as do our native Indians, and the present state of our comforts and delicacies. Manufactures of silk are admirably adapted for our warmer seasons, by their strength, their lightness, their pliability, their susceptibility of every variation of colour. They are a necessary of life, and will be used, as they have been, by millions in this country, unless a dark age of disaster and poverty, a degradation such as Europe has at least once experienced, should be our portion. With these views we shall insert some short observations on the cultivation of silk from the British Encyclopedia.

If the culture should succeed, or be adopted with spirit, we shall, from year to year, insert from the French and Italian writers more minute directions for the management of the silk worm, and of its curious productions.

“ Though the silk worm be a native of China, there is
“ no doubt but it might easily be propagated perhaps in
“ most of the temperate zones. The eggs of this insect in-
“ deed, require a considerable degree of warmth to hatch
“ them, but they also can endure a severe frost. No less

" than 5,400 pounds of silk was raised in 1789 in the cold
" sandy territories of Prussia. In the province of Pekin,
" in China, where great quantities of silk are fabricated,
" the winter is much colder than *even in Scotland*. From
" the information of some Russians, who were sent thither
" to learn the Chinese language, we find that Reaumur's
" thermometer was found from 10 to 15 degrees below
" the freezing point. Nor is it difficult to rear the food of
" the silk worm in a temperate climate. The mulberry
" tree is a hardy vegetable, which bears, without injury, the
" winters of Sweden, and even of Siberia. Of the seven
" species of the mulberry, four of them, (to wit the white,
" red, black, and Tartarian,) it is believed could be reared
" in Britain and Ireland. The white grows in Sweden, the
" red is abundant round Quebec—the black delights in
" bleak situations, exposed to winds on the sea shore—and
" the Tartarian is represented as growing in the chilly
" regions of Siberia.

" As to the superior qualities of the different species, pro-
" bably there is very little to be pointed out amongst the
" four just mentioned with regard to nourishment, except
" what may be drawn from the following fact: that if the
" three first mentioned are laid down together, the silk worm
" will eat, first, the white, then the red, and next the black
" in the order of the tenderness of the leaves; but all must
" yield to the white which seems to be its *natural food*.

" In Calabria (Naples) the red mulberry is used; in Va-
" lencia (Spain) the white; and in Granada, where excel-
" lent silk is produced, the mulberries are all black. The
" white seems to flourish very well in a moist stiff soil. The
" black agrees very well with a dry, sandy, and gravelly
" soil, and is most luxuriant in a rich moist loam."

[*Note*.—There seems to be some negligence in this remark. The white mulberry is said to prosper very well in a moist *stiff* soil, and yet it is said to be most luxuriant in a rich moist loam. The experience which we have had induces

us to believe, that the white mulberry flourishes best in a rich garden loam, *not* moist, and we think those who cultivate this plant, should prefer for its culture their best soils. It is however encouraging to learn, that the best silk is produced from the black mulberry, which in our country will grow in all soils, though we doubt, nay, our own experience enables us to doubt, the assertion, that it agrees well with a sandy and gravelly soil. It will *exist* in such a soil, but its growth is feeble, and from long experience we are enabled to say, that in our hot and dry climate it is not expedient to plant the black mulberry in warm, dry, and shallow soils. Yet it is important to us to know, that excellent silk may be produced from the black mulberry.—*Editors.*]

“ It may justly be asserted,” say the Editors of the Encyclopedia, “ that Britain possesses some advantages in the “ raising of raw silk which are not enjoyed by warmer “ countries. Even in the south of France Arthur Young “ informs us the mulberry leaves are often nipped by frost “ in the bud, but this is *scarcely* ever the case in Britain.” [During 30 years’ experience we have never known the mulberry to be affected either by winter or spring frosts in this country. It is the latest tree to put forth its leaves, and it is not affected by our latest frosts.—*Ed.*]

“ It is well known that thunder and lightning are hurtful “ to the silk worm. Now our climate (Great Britain) can “ boast that it is almost wholly exempted from those dread- “ ful storms of thunder and lightning which prevail so much “ in hot climates.” [This remark wants confirmation.]

“ Nature,” say the English writers, “ has then furnished “ us with every thing requisite for the silk manufacture; it “ remains only for us to improve the advantage which we “ possess. Let mulberry trees be planted by proprietors “ of land, and let a few persons of skill and attention devote “ themselves to the raising of silk worms. This is an em- “ ployment which will not interfere with any manufacture “ already established:—on the contrary, it would afford a

"respectable, a lucrative, and agreeable employment to ladies who have at present too few professions, to which they can apply." [If these remarks were applicable to Great Britain, how much more forcible are they to our country. It is well known that the females of Great Britain, and still more those of France, contribute essentially to the support of their families, and the productive labour of their respective nations. With us, the female sex are by our usages almost excluded from the sphere of productive industry.—*Editors.*]

"The following method of raising mulberry trees from seed is practised in the south of France, and has been repeated by Dr. Anderson of Madrass :—Take the ripe berries when they are full of juice and of seeds, next take a horse-hair line or rope, and with a good handfull of ripe mulberries run your hand along the line bruising the berries, and mashing them as much as possible as you pass your hand along, so that the pulp and seeds of the berries may adhere in great abundance to the rope or hair line; then dig a trench in the ground where you propose to plant; cut the rope or line into parts equal in length to the proposed trenches, and then bury the rope in them, always taking care to water them well, which is essential to success. The seeds of the berries, thus sown, will grow, and send up young suckers, the leaves of which are the best food for the silk worm. The facility and rapidity with which young leaves may by this means be produced, is evident, for as many rows of trenches may thus be filled as can be wished, and it can never be necessary to have mulberry trees higher than our raspberries, gooseberries and currants. Whenever they get beyond that, they lose their value, and if these trenches succeed you may have a fresh supply coming up day after day, or any quantity you please. Thus an abundance of these trees may be reared. But as mulberry trees are not yet found in abundance in Britain, it were to be wished that

"some other food could be substituted in their place.
"Attempts have been made, and it has been found possi-
"ble to support the silk worm on lettuce."—*British Ency-
clopedia. Art. Silk.*

The editors then proceed to give an account of successful attempts to support the silk worm on lettuce, but still it seems to be well understood that the mulberry of various sorts, and especially in preference the white, are its natural, favourite, most wholesome diet.

We acknowledge that the article which we have just quoted is very loose and unsatisfactory. We are not told whether this hair line is buried in the summer, at the time when the mulberries are ripe, or whether the rope so prepared is kept till the spring after, and then planted. We are left in ignorance whether the seed of the mulberry vegetates instantly; how soon the act of stripping commences; and to what extent it is pursued. We are not informed how long the hedge row of mulberry bushes, (for they must be so considered,) endures. Stinted, we know they must be, from the continued destruction of their leaves. No plant could sustain such repeated injuries without suffering most essentially. The method of distributing the seeds seems to us to be very coarse and inartificial. Hair rope is not always easily procured; the seeds must be unequally distributed, and sown too thick. Even if it is the practice in the south of France, we should be disposed to think it a bad one. The seeds of the mulberry may be separated from the pulp like the seeds of all other berries, by mashing them and pouring water upon them and stirring the mixture till the seeds fall to the bottom, when they may be collected and dried, and sown at equal distances. We must suppose that the best time of sowing would be the spring, especially in our climate, in order to enable the young plant to acquire sufficient firmness to resist the next winter's frost. The great difficulty, we apprehend, in the

way of new experiments here, would be the procurement of seeds of the white mulberry in sufficient quantities.

The seeds of the black mulberry are easily obtained, and may serve to introduce the culture of silk, until we can procure the white mulberry seeds in sufficient quantity. The only point of any importance which is stated by the learned editors of this work, is, that the plants are not suffered to grow into trees. They are kept down so as to be within the reach of children from the ground. No doubt this is essential—the labour would be too great if the gatherers of the leaves were obliged to mount upon ladders to collect them.

Cultivators of the white mulberry can import the tree from the Linnean Garden, owned by Mr. Prince, at Flushing, Long Island, near New York. Two or three trees might be kept as standards for the production of fruit. They grow with great rapidity, and bear in the very first year after they are transplanted. From two or three trees a sufficient quantity of ripe seeds may always be obtained to furnish the small shrubberies necessary for the support of the silk worm. Another impediment will occur in the commencement of the experiment; the procuring a sufficient number of cocoons, containing the male and female insects. But they exist in our own country, and we hope that a liberal feeling will be encouraged among those who have heretofore raised them, and that they will be ready to co-operate in the exertion which, we hope, is about to be made for the extensive cultivation of this branch of industry.

It would be very desirable that those persons who have already entered into this employment in New England, should send to the Editor of the New England Farmer, some account of their success, and of the various processes necessary to the cultivation.

If we were to insert all which European writers have said upon the subject, it would neither be received with so

much confidence, nor be entitled to as much respect as that of our own cultivators.

So much depends upon climate, upon the price of labour, upon the demand for the production, that our own experience is of far higher value than that of any other nation.

Yet with all our ignorance of this culture, with the discouragements, which any new employment of capital and skill must encounter, we feel convinced that the time has arrived in which the production of silk may be undertaken with safety, we hope with great profit.

Since the foregoing remarks were committed to the press, being much dissatisfied with the negligent manner in which the subject was treated in the British Encyclopedia, we have had recourse to the work of the Abbé Rozier, entitled "Cours Complet d'Agriculture," etc. and although we cannot at this time, and having extended this article to so great a length, give at large his extensive treatise, yet we may and perhaps ought to add some general hints derived from an authority so much more entitled to weight than any British writers on this subject can be. We shall only insert at present some general rules, which we gather from this French work.

The first is, that they consider the white mulberry the best adapted for the food of the silk worm. They speak of no other food except the various sorts of mulberries as being adapted to the successful culture of this insect.

The second is, that the quality of the silk depends in a very great degree upon the soil and exposure of the mulberry plant or tree. That the most vigorous growth, and the most luxuriant and largest sized leaves are not the best adapted for the production of the best silk.

"The leaves for the purpose of producing the best silk, are those which are grown in dry land, stony, elevated and sandy." "The trees produce fewer and smaller leaves than those grown in rich soils, but their leaves have more

flavour and are more nutritive." [This doctrine is certainly favourable to the culture of the silk worm in the gravelly, stony, and sandy soils of New England.]

"The quality of the leaves of the mulberry is affected by various circumstances. 1st. The age of the plants. The leaves of a young tree are more watery, the juices less concentrated, than in an old one."

"The exposition, the exposure has also great effect. Trees planted in a northern exposure or aspect are *always* below mediocrity, or inferior in quality; the juices are too watery, and the worms do not thrive as well upon them. Those raised on hill sides with a southern exposure are preferable to those grown on plains."

3. The berries gathered for seed cannot be *too ripe*. When they are just barely fit for eating not more than fourteen per cent. will vegetate. When fully ripe and ready to fall more than half the seeds have usually grown; if left till they are dry, nearly all have succeeded. The mode of obtaining seed is to dry the berries, and when wanted to rub out the seed, and fan away the dried pulp.

4. As to the time of sowing.—In the most southern parts of France they sow as soon as the seed is ripe, but the most usual course is to sow the following spring. In France, according to the climate of different provinces, in February, March and April. In New England we could not sow till April or May.

5. The manner of sowing.—They sometimes sow in the spot where the young mulberry is to grow for the first three years; but they prefer sowing them in boxes about three feet long, and nine inches deep. The reason assigned is, that they are more easily watered and sheltered against frost. They remove them from the boxes into rows in a nursery which is done without injury to the roots by taking off one of the sides of the box. Rozier remarks upon the practice of rubbing the berries on a hair rope, and then

burying it in the earth, that it is an useless complication of labour.

6. The French seem to be in the constant practice of grafting their mulberries. No satisfactory reason seems to be assigned for this certainly expensive process; but as they are very familiar with the cultivation, no doubt experience must have shown them the value, or the French, being habitual economists, would not have adopted it.

7. It was formerly the practice in France to plant out the mulberry as standards, and to suffer them to attain a considerable size, taking care, however, so to manage the pruning as to keep all the limbs within the reach of gathering ladders. The practice is of late much changed. It was observed, says Rozier, that the young plants in nurseries put forth their leaves much sooner than the standard trees, and the necessity of obtaining early food for the young insect obliged the cultivators to provide themselves with a *certain number* of mulberries in the bush or shrubby state.

From these first experiments arose the prevalent practice of raising dwarf mulberries extensively, and also of surrounding their fields with mulberry hedges. It is said that the produce of an acre in dwarf mulberries is much greater than one in large trees, the distance between the plants being so much less, so that the number of dwarfs may be eight times as great. This is admitted to be true at first, but some cultivators deny that it continues to be so after the standard trees have attained their full size. The benefits of the dwarf cultivation are thus briefly stated:—1st. Women and children can gather the leaves without danger, and much quicker than the most experienced gatherers could on large trees. 2d. The proprietor is much more speedily repaid his advances. 3d. The dwarf mulberries put forth their leaves earlier, a valuable quality, as the more early the worms are produced the better. 4th. Dwarf trees will succeed in situations in which standards will not. 5th.

Their leaves are quite as good as those of the others, but the leaves of young plants should be given to newly hatched worms, and those of the older to the more mature.

This very brief sketch is all which we have room for at present. Should the culture be extensive we shall be more full in our extracts.

Cattle Show, Exhibition of Manufactures, Ploughing Match, and Public Sale of Animals and Manufactures, at Brighton, Mass. on Wednesday and Thursday, the 18th and 19th of October, 1826. To commence at 9 A. M. on the first day, and at 10 A. M. on the second day.

THE Trustees of the Massachusetts Society for the Promotion of Agriculture, encouraged by the patronage of the Legislature of this state, intend to offer in premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c. at Brighton, on Wednesday and Thursday, the 18th and 19th of October, 1826; and they offer the following Premiums:

FOR STOCK.

For the best Bull, raised in Massachusetts, above one year old	-	-	-	-	-	\$30
For the next best, do. do.	-	-	-	-	-	20
For the next best, do. do.	-	-	-	-	-	10
For the best Bull Calf, from five to twelve months old	-	-	-	-	-	15
For the next best, do. do.	-	-	-	-	-	10
For the next best, do. do.	-	-	-	-	-	5
For the best Cow, not less than three years old	-	-	-	-	-	30
For the next best, do. do.	-	-	-	-	-	20
For the next best, do. do.	-	-	-	-	-	15

PREMIUMS.	95
-----------	----

For the best Heifer (having had a calf,) -	15
For the next best, do. do. - -	10
For the best Heifer, (not having had a calf,) -	12
For the next best, do. do. - -	10
For the next best, do. do. - -	8
For the next best, do. do. - -	6
For the best Ox, fitted for slaughter, regard to be had to, and a particular statement to be given of, the mode and expense of fatting - - -	25
For the next best, do. do. - -	20
For the next best, do. do. - -	10
For the best pair of Working Oxen, - -	25
For the next best do. do. - -	20
For the next best, do. do. - -	15
For the next best, do. do. - -	12
For the next best, do. do. - -	8

[No oxen will be admitted to trial as *working oxen* under *four years old*.]

For the best Merino Ram - - -	15
For the next best, do. - - -	10
For the best Merino Ewes, not less than five in number -	20
For the next best, do. do. do. - - -	10
For the best Boar, not exceeding two years old, to be kept at least one year for breeding, - - -	12
For the next best, do. do. - - -	8
For the next best, do. do. - - -	5
For the best Sow, to be kept at least one year for breed- ing, - - - - -	12
For the next best, do. - - - -	8
For the next best, do. - - - -	5
For the best Pigs, not less than two in number, nor less than four months old, nor more than eight - -	10
For the next best, do. - - - -	5

None of the above animals will be entitled to premiums, unless they are *wholly bred* in the state of Massachusetts.

Any of the above stock, when raised and still owned at the time of the exhibition by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

NEW PREMIUMS FOR SHEEP.

For the best Dishley or New Leicester Ram	-	\$15
For the best, do. do. Ewe	-	15
For the best South Down Ram	-	15
For the best do. Ewe	-	15

The above four premiums will be awarded on sheep either imported or raised in the state.

The persons claiming these premiums to engage to keep the imported animals within the state.

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future premium of the Society, except it be for an entirely distinct premium, and for qualities different from those for which the former premium was awarded.—
Any animal which shall have obtained a premium as a Milch Heifer shall not afterwards be entered for premium as a Milch Cow.

FOR GRAIN AND VEGETABLE CROPS.

To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than one hundred bushels	-	\$20
To the person who shall raise the greatest quantity of vegetables, (grain, peas and beans excepted,) for winter consumption, of the stock of his own farm, and not for sale, in proportion to the size of the farm and stock kept, having regard to the respective value of said vegetables as food, stating the expense of raising the same, and the best mode of preserving the same through the winter	-	30
To the person who shall raise the greatest quantity of		

Winter Wheat on an acre, not less than thirty bushels	\$20
To the person who shall raise the greatest quantity of Spring Wheat on an acre, not less than thirty bushels	20
To the person who shall raise the greatest quantity of Barley on an acre, not less than forty-five bushels	20
To the person who shall raise the greatest quantity of Rye on an acre, not less than thirty bushels	20
To the person who shall raise the greatest crop of Millet on an acre, cut and cured for hay, not less than three tons, the claimant giving evidence of the time of sowing, the quantity of seed sown, and the quantity of hay produced	20
To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels	20
To the person who shall raise the greatest quantity of common Beets on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Sugar Beets on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels	20
To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Turnips on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of	

Onions on an acre, not less than six hundred bushels	\$20
To the person who shall raise the greatest quantity of Cabbages on an acre, not less than twenty-five tons weight, free from earth when weighed	20
To the person who shall raise the greatest quantity of dry Peas on an acre, not less than thirty bushels	20
To the person who shall raise the greatest quantity of dry Beans on an acre, not less than thirty bushels	20
To the person who shall give proof of having produced the largest quantity of dressed Flax, raised on half an acre, and not less than two hundred and fifty pounds	20

To entitle himself to either of the premiums for Grain or Vegetable crops, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium, and must state in writing, under oath of himself, and one other person, (accompanied by a certificate of the measurement of the land by some sworn surveyor,) the following particulars:

1. The state and quality of the land, in the spring of 1826.
2. The product and general state of cultivation and quantity of manure employed on it the year preceding.
3. The quantity of manure used the present season.
4. The quantity of seed used, and if Potatoes, the sort.
5. The time and manner of sowing, weeding, and harvesting the crop, and the amount of the product, ascertained by actual measurement, after the whole produce, for which a premium is claimed, is harvested, and the entire expense of cultivation.
6. In regard to Indian Corn, the entire crop of the acre offered for premium, if shelled, must be measured between the 15th November and 1st December. If not shelled, the whole must be weighed within the same

dates, and the trustees have determined to consider *seventy-five pounds of corn and cob* as equivalent to one bushel of shelled corn.

And in relation to all vegetables, (except Potatoes, Onions, and common Turnips,) at least *forty* bushels must be weighed, and *fifty-six pounds* will be considered as equal to one bushel, free from dirt.

AGRICULTURAL EXPERIMENTS.

For a mode of extirpating the worm that attacks the Locust Tree, which shall appear to the satisfaction of the Trustees to be effectual	- - - - -	\$50
For a mode, hitherto unknown, to extirpate the <i>Borer</i> that attacks the Apple Tree, which shall appear to the satisfaction of the Trustees to be effectual and cheaper than any mode now in use	- - - - -	50
To the person who shall give satisfactory evidence on "Soiling Cattle," not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated	- - - - -	30
To the person who shall make the experiment of turning in green crops as a manure, on a tract not less than one acre, and prove its utility and cheapness, giving a particular account of the process and its result	- - - - -	20
To the person who shall prove to the satisfaction of the Trustees, that his mode of rearing, feeding, and fattening neat cattle is best	- - - - -	20
To the person who shall prove to the satisfaction of the Trustees, the utility and comparative value of the cobs of Indian corn, when used with or without the grain itself, ground or broken	- - - - -	20
The claim under the two last heads, together with the evidences of the actual product, must be delivered, free of expense, to Benjamin Guild, Esq. in Boston, Assistant Recording Secretary of this Society, on or before the first day of December next—the Trustees not intending		

to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

BUTTER, CHEESE, HONEY, CIDER, Currant Wine.

To the person who shall take up in the season, on his own farm, the greatest quantity of good honey, and shall at the same time exhibit superior skill in the management of Bees. [If there be any thing supposed to be new in the management, the same to be communicated in writing.]	\$10
For the best Cheese <i>not less</i> than one year old, and not less in quantity than one hundred pounds	10
For the next best, do. do.	5
For the next best Cheese <i>less</i> than one year old	10
For the next best, do. do.	5
For the best Butter, not less than fifty pounds	15
For the next best, do. do.	10
For the next best, do. do.	7
For the next best, do. do.	5
For the greatest quantity of Butter and Cheese, made between the 15th of May, and the 1st of October, from not less than four cows, the quantity of Butter and Cheese, and the number of cows to be taken into consideration, and specimens to be exhibited at the Show, of not less than twenty pounds of each, and the mode of feeding, if any thing besides pasture was used	20
For the best specimen of Cider, not less than one barrel, made in 1824, manufactured by the person who shall exhibit the same, and from apples grown on his own farm	15
For the second best barrel	10

The person obtaining the first premium shall be entitled to a further sum of \$5, as a compensation for the premium barrel of cider, which will be retained and used at the Show Dinner, in order that he may have the credit of it.

[These premiums will be continued in future years. Persons claiming them must state, in writing, their process of making and managing their cider, and the kind of apples used.]

For the best specimen of Currant Wine, not less than one gallon, exhibited by any person who shall have made not less than 30 gallons, in the same season in which that which shall be exhibited was made, (a statement to be given, in writing, of the process of making the same,) - - - - . \$10

For the next best, do. - - - - 5

FOR INVENTIONS.

To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre - - - - - 20

To the person who shall invent the best Machine for pulverising and grinding plaster to the fineness of twenty-five bushels per ton, and which shall require no more power than a pair of oxen or horse, to turn out two tons per day, and so portable that it can be moved from one farm to another without inconvenience - - - - - 30

To the person who shall produce, at the Show, any other Agricultural Implement, of his own invention, which shall in the opinion of the Trustees, deserve a reward, a premium not exceeding *Twenty Dollars*, according to the value of the article exhibited.

In all cases proofs must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

Persons who have taken out patents for their inventions, are not thereby excluded from claiming any of the above premiums.

No claimant will be entitled to a premium unless in the opinion of the Committee, the machine or imple-

ment presented by him shall be superior to any designed for the same use, which shall have heretofore gained a premium.

FOR RAISING TREES AND HEDGES.

To the person who shall, on or before the first day of December, 1829, produce proofs of having, after this day, raised the greatest amount in value of Mulberry plants, either in standards, dwarfs or in hedges, for the purpose of raising the Silk Worm, and shall exhibit not less than <i>five pounds</i> of unmanufactured or raw silk of his own production	\$100
For the best plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the first of September, 1827	100
For the best plantations of White Ash, Larch, and Locust trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state on the first of September, 1827	50
For the best Live Hedge, made either of White or Cockspur Thorn, planted after 1820, not less than one hundred rods, and which shall be in the best thriving state in 1827	50
For the best Buckthorn Hedge, not less than one hundred rods, and which shall be in the best thriving state in 1828	50
To the person who shall have planted out on his farm, since the spring of 1816, the greatest number of Apple Trees, not less than one hundred in number, and who shall exhibit to the Trustees, at the Show, in 1827, satisfactory evidence of his having managed them with care and skill	50

FOR DOMESTIC MANUFACTURES.

To the person or corporation who shall produce the

best specimen of fine Broadcloth, not less than 1 5-8 yards wide, exclusive of the list, forty yards in quantity, and died in the wool	-	-	\$20
For the second best, do. do. do.	-	-	15
For the best superfine Cassimere, not less than 3-4 yard wide, or less than forty yards in quantity	-	-	12
For the second best, do. do. do.	-	-	9
For the best superfine Sattinet, 3-4 yard wide, not less than fifty yards	-	-	8
For the second best, do.	-	-	5

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than twenty yards in quantity	-	-	12
For the second best, do. do.	-	-	8
For the best double milled Kersey, 3-4 yard wide, not less than twenty yards in quantity	-	-	12
For the second best, do. do.	-	-	8
For the best Coating, 3-4 yard wide, not less than twen- ty yards in quantity	-	-	8
For the second best, do. do.	-	-	6
For the best Flannel, 7-8 yard wide, not less than forty- five yards in quantity	-	-	10
For the second best, do. do.	-	-	7
For the best yard wide Carpeting, not less than thirty yards in quantity	-	-	15
For the second best, do. do.	-	-	7
For the best 5-8 yard wide Stair Carpeting, not less than thirty yards in quantity	-	-	10
For the second best, do. do.	-	-	7
For the best pair of blankets, not less than 8-4 wide and 10-4 long	-	-	6
For the second best, do. do.	-	-	4
For the best Woollen Knit Hose, not less than 12 pair in number	-	-	5
For the second best, do. do.	-	-	3

For the best Worsted Hose, not less than 12 pair in number	-	-	-	-	5
For the second best, do. do.	-	-	-	-	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number	-	-	-	-	4
For the second best, do. do.	-	-	-	-	2
For the best Men's Woollen Gloves, not less than 12 pair in number	-	-	-	-	5
For the second best, do. do.	-	-	-	-	3
For the best Linen Diaper, 5-8 yard wide, not less than 30 yards in quantity	-	-	-	-	3
For the second best, do. do.	-	-	-	-	3
For the best yard wide Diaper, (for table linen) not less than 10 yards in quantity	-	-	-	-	10
For the second best, do. do.	-	-	-	-	5
For the best specimen of Sewing Silk, raised and spun in this state, of good fast colours, not less than one pound	-	-	-	-	5
For the second best, do. do.	-	-	-	-	3
For the best Linen Cloth, (for shirting or sheeting) one yard wide and twenty-five yards long	-	-	-	-	3
For the second best, do. do.	-	-	-	-	4
To the person who shall produce the best specimen of any Cotton Fabrics in private families, not less than five pieces	-	-	-	-	20

All of the above manufacture smust be manufactured within the state of Massachusetts. And all manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed so as not to be seen, or known by the Committee, nor must the Proprietors be present when they are examined; in default of either of these requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, or manufactured articles, may be offered for premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever, merely from a want of competition, any of the claimants may be considered entitled to the premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom premiums shall be awarded, may, at their option, have an article of Plate with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered, the Trustees may, having regard to the circumstances of the competitor, award either one of the Society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the Society's premiums shall be discovered to have used any disingenuous measures, by which the objects of the Society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but be rendered incapable of being ever after a competitor for any of the Society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

PLOUGHING MATCH.

On the second day of the Cattle Show, viz. the 19th day of October, Premiums will be given to the owners and ploughmen of three Ploughs, drawn by two yoke of oxen, and to the owners and ploughmen of three ploughs drawn by one yoke of oxen, which shall be adjudged by a competent Committee, to have performed the *best work, with least expense of labour*, not exceeding half an acre to each plough. Notice will be given in the public papers, at least six weeks before said day, that a piece of ground has been provided for twenty ploughs—ten double and ten single teams; and that entries may be made of the names of the

competitors until the morning of the 19th. Preference will be given to those who enter first; but if, on calling the list at the hour appointed, precisely, those first named do not appear, the next in order will be preferred. There will be two Committees of three persons each—one to be the judges of the ploughing by double teams, the other of the ploughing by single teams—the latter to have assigned to them a part of the field distinct from that of the double teams.

Premiums as follows, (being the same for the double and single teams.)

First Plough	\$15	Second Plough	\$10	Third Plough	\$6
Ploughman	8	Ploughman	5	Ploughman	3
Driver	4	Driver	3	Driver	2

In each case, if there be no driver, both sums to be awarded to the ploughman.

The persons intending to contend for these Prizes, must give notice in writing, to GORHAM PARSONS, Esq. of Brighton. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee on the subject. The ploughs to be ready to start at 10 o'clock, A. M.

The result of the last Ploughing Matches at Brighton, and the satisfaction expressed by so many of our agricultural brethren, will induce the Society to continue these premiums annually, in connexion with the Cattle Show, as an efficacious means of exciting emulation and improvement in the use and construction of the *most important instrument* of agriculture.

The trial of Working Oxen is to take place on the first day at 11 o'clock.

Persons intending to offer any species of stock for premiums, are requested to give notice thereof, either by letter (post paid) stating the articles, or to make personal application to the Secretary of the Show, [JONATHAN WINSHIP, Esq.] Brighton, on or before the 17th day of October, in

order that he may enter such notice or application, so that tickets may be ready at 9 o'clock on the 18th. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

All articles of manufactures and inventions, must be entered and deposited in the Society's Rooms, on Monday, the 16th of October, and will be examined by the Committees on Tuesday, the 17th, the day before the Cattle Show; and no person but the Trustees shall be admitted to examine them before the Show. The articles so exhibited, must be left till after the Show, for the satisfaction of the public.

The applicants will be held to a rigid compliance with this rule relative to entries as well as the other rules prescribed.

The examination of every species of stock, will take place on the 18th, and Ploughing Match on the 19th of October.

The Trustees also propose to have the *Sale of Animals and Manufactures on the first day of the Cattle Show*. Besides such animals as may have been offered for Premiums, any others that are considered by them as possessing fine qualities will be admitted for sale. Sales to commence at 12 o'clock precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before 10 o'clock of the 18th. Auctioneers will be provided by the Trustees.

By order of the Trustees,

R. SULLIVAN,

J. PRINCE,

G. PARSCNS,

E. H. DERBY,

Committee.

January, 1826

Boston, Feb. 1, 1826.

TO THE CORRESPONDING SECRETARY OF THE MASSACHUSETTS AGRICULTURAL SOCIETY.

THE appendix promised to the remarks made in the preceding numbers of the Agricultural Repository as to the age and peculiar circumstances of the Orchard and Forest, have been submitted as to the former. Those on the Forest now follow.

It may be thought somewhat too excursive for the object and character of this Journal, which aims at improvement in annual crops, or more immediate practical results, to look so far back, and with too little certainty, for the laws which govern vegetable life, that we may be instructed for the future.

But the reign of this monarch of the vegetable kingdom extends through so many generations, and is as yet so undefined, that we are prompted to inquiry and research by something more than curiosity.

It is surprising what a degree of uncertainty generally exists as to the age of Trees beyond a given period. It is but very seldom that any corporate or other record occurs that can be satisfactorily relied on. In general they are presumed to have been set out when the house was built near which they stand, or by tradition, which is liable to great inaccuracy, by some predecessor far removed. In some instances which will follow a sufficient degree of accuracy has been arrived at. Others are left to inference, with such light as could be had on the subject. Amongst the instances best ascertained are two venerable Elms, lately standing before the house in Natick, formerly occupied by the Rev. Oliver Peabody, the successor of the celebrated Elliot, the Indian Apostle, so called. The latter made only occasional visits, tho' so acceptable to the Indians here

placed, as to have received many testimonials from them, besides the orchard before mentioned.

Mr. Peabody was settled in the ministry to the Indians in Natick, in the year 1722, and it has often been told me by his daughter, (some time since deceased,) as well as by others, that a deputation of Indians came, one bearing two Elm trees on his shoulders; that they presented themselves and requested permission of their minister to be allowed to set out those trees before his door, as a mark of their regard, or as the *Tree of Friendship*.

These trees flourished for about ninety years, when the larger one was stricken by lightning, and soon after failed. The other is in a state of decisive decline. These measured, one foot from the ground, about 21 feet, and in the smallest part, for 14 feet up, 13 feet. The growth was about $1\frac{1}{2}$ inches per year. The Rev. O. Peabody died in 1752, after 30 years' ministry.

In 1753 the Rev. Stephen Badger was settled as the successor of the last mentioned gentleman. A like request was made by the Indians, and the same ceremony took place in the planting the Trees of Friendship before the door of the Rev. Mr. Badger. These trees are now in full vigour, having been set out 73 years. They are about 15 feet in circumference, near the ground, and nine feet above in the smaller part, and have given, in circumference, nearly $1\frac{1}{2}$ inches growth a year.

The Elm attains a great size in lighter soils, and on plains, commons, high ways, &c. Cambridge has produced several that have been remarkable; there is one on the common that measures, near the ground, about 16 feet, above, 13 feet; another spreads to 22 feet, and is, above, 12 feet.

There was in the College Yard a very fine Elm, which was unfortunately destroyed, as is said, by the great quantity of pickle thrown about it when our troops occupied the colleges during the revolutionary war.

Of another Professor Sewall in his Eulogy on Dr. Winthrop thus speaks: "Under a venerable Tree, lately stand-

ing on our common, Governor Winthrop was wont to call together his little senate."

In Framingham there is one in the high way near the house of Mr. Haven, set out by his father about 90 years since. It measures, a foot from the ground, 20 feet; it is of great height, and is, for 10 feet above, 12 feet.

There are several more in Framingham, Stow, &c. of great beauty, which nearly correspond in measure, being near the ground about 18 feet, and above, about 13 feet.

In Lancaster there are many much admired Elms—two which measure, at the ground, 19 feet. That by the house of Wm. Stedman, Esq., set out by Col. Willard, is of great beauty. It retains its size far up about 15 feet.

In Essex several are spoken of. One which was cut down in Salem not long since, it is there thought would outdo all competition. Another on Mr. Crowninshield's farm measures, one foot from the ground, 22 feet; four feet above, 14 feet.

There are two fine Elms on Mr. Lowell's estate, in Roxbury, one of which spreads remarkably near the ground, to 27 feet, and is above about 18 feet.

There is a remarkable Elm Tree about three miles from Providence, as to which the Marshall of Rhode Island, the late E. Dexter, Esq. wrote me: "I have measured the Elm in Johnston, as you requested. It is, 3 feet from the ground, 21½ feet, and holds nearly that size for 12 feet. Mr. King, the owner, informed me that it was computed to contain 12 cords of wood.

Of the trees which have excited notice in this city there is no certainty as to the age of those in the Mall, on the border of the Common. But of those in what is called the Short Mall, east of the burial ground, Major Bumstead states, "That in the year 1762, the planting of the trees in common street took place by Major Adino Paddock and Mr. John Ballard. These trees, several of them, measure about 9 feet at 4 feet from the ground, and give a

growth of over $1\frac{1}{2}$ inches in circumference in a year. They are what we here call the English Elm.

Liberty Tree, so called, stood at about 50 feet from the corner of Essex street. It was a fine majestic tree, overshadowing the house at the corner, of the proprietor Mr. Elliott, a bookbinder. In this building, then plastered and of antique form, but now changed in its exterior, was a Hall, large for the times, of about 20 feet square, where the Whigs used to assemble. These meetings imparted to the tree a great degree of notoriety. As early as 1765 a sort of effigy of the Earl of Bute was suspended therefrom. Afterwards Mr. Andrew Oliver, who was stamp master, made his recantation under it. Notices were placed thereon, and many public acts and ceremonies were here had, as the journals of those times will more particularly show.

The tree near Castle street has been often remarked upon. It was lately prostrated by the axe to make way for a block of buildings. It measured at two feet from the ground about 13 feet, and by counting the rings would be deemed about 110 years old.

But, after all our research, the *Elm of Boston Common* overtops its race, and stands pre-eminent in this neighbourhood at least. It is a beautiful and finely proportioned object; near the ground it measures 23 feet, and about three feet above 20 feet in circumference. There are many rumours as to the setting out of this tree. Amongst the most probable there is one that an ancestor of Governor Hancock's family, Deacon Henchman, was the individual who conferred this benefit on the public.

In closing these notices of the Elm, it may be considered not improper to notice a publication stating the measurement of the Elm in Hatfield as of 34 feet circumference at 2 ft. from the ground, and 24 ft. 3 in. above, with a supposition that it was the largest tree in New England. The Gazette of Northampton states that there are several Elms which would compete therewith in that place, measuring 21,

22, and even 25 feet, and that one is said to measure 28 feet at some distance above the ground. If these are given correctly, they are of extraordinary magnitude.

The Chesnut, though it is not thought to compare with the Elm as an ornamental tree, may yet vie with it in size, and is of more value for timber. The measure of three only will be given. One in Holden is at the ground 21 feet, and narrows but little above. Two in the lot of Mr. Valentine, in Hopkinton, one is $25\frac{1}{2}$ feet, and above $17\frac{1}{2}$ feet. The other is at the surface 23 feet, soon dividing into separate limbs.

The oak is in all probability the most long lived of the forest. In the lot in Dorchester, given by Gov. Stoughton for the benefit of college education, to Dorchester scholars, I have measured several white oaks, which have been from 18 to 20 feet circumference, and in one of them counted upwards of 200 rings, indicating as many years. The black oak has been found to attain about the same size.

I close with the dimensions of the Hartford White Oak, or Charter Tree, so often alluded to. It is at the ground 36 feet, and in the smallest part 25 feet. The manner in which the Charter was concealed in it is matter of history and before the public.

I have in the paper on the forest said that the time when trees were most advantageously cut was when the period of quickest growth is over. But ornamental trees so continue long after that time, whilst others are prostrated.

I shall be gratified if what has been submitted conduces to the better management of the woodlot. Or if by showing how our commons, high ways, and pleasure grounds have been adorned and made interesting by those who have preceded us, I can excite or strengthen any efforts to the promotion of objects of such utility.

I am, sir, respectfully yours,

JOHN WELLES.

MASSACHUSETTS AGRICULTURAL JOURNAL.

Vol. IX.]

JULY, 1826.

[No. 2.

THE RAISING OF THE SILK WORM, AND THE PRODUCTION OF SILK, IN MASSACHUSETTS.

IT is a very curious, and at the same time an encouraging fact, that without any previous concert, there should have been a simultaneous, or correspondent exertion, in every part of the United States, to bring the subject of raising silk into notice. We consider it an encouraging fact, because it indicates a general sense both of its importance, and practicability; and no great improvement is, or can be introduced into any country, without such a general awaking of the publick attention to it. It is the more singular in this case, as the efforts were not concerted, but at the same moment, in South Carolina, in Congress, and in Massachusetts, the subject was presented as one worthy of attention, and experiment. The following paper by Mr. Genet is very satisfactory, and proves, as far as facts can prove, that the United States, from New Hampshire to South Carolina, and Georgia, and perhaps Louisiana, are well adapted to the cultivation of the silk worm, and its products. Our Society have offered premiums on this subject, but the Legislature might do more by affording its patronage. It requires so little land, and employs such a class, and description of our population, otherwise almost unproductive, that it seems eminently to recommend itself to the publick notice, and favour. We take this occasion to say, that this is one of the *strongest* examples of the utility of publick journals devoted to agriculture.--In thirty

days you receive the suggestions of intelligent persons in every part of our country, and such suggestions are often of the highest value. We hope within two years to have it in our power to award the premiums offered for the cultivation of the Mulberry, and production of the silk worm, to persons in this State. We deem it to be our duty to republish these articles in our Journal, as *one* of the means of dissemination of this knowledge; for though the American Farmer, and the New England Farmer ought to be received in every town of the State, yet we fear, that they are not seen by one tenth part of our population. When the Farmer's newspapers shall have as free and general a circulation, as they deserve, we may suspend the publication of *our* Journal, but until that time shall arrive, we believe that no money of the State is better expended, than that, which places in the hands of every member of the Legislature, a copy of our Journal *imperfect as it is*. Imperfect it must be, until the farmers at large, are willing to be contributors to it, yet we have perceived, that it has had no small influence in creating and exciting a taste for inquiry among agricultural men; and this taste once excited, the object is attained. Individual ingenuity, and the spirit of emulation will do the rest.

It may be proper to say, that although Mr. Genet prefers the white mulberry (*Morus Alba*) for the northern States on the ground that it will flourish better in these States, yet it is a fact, that the black mulberry, (*the Nigra*) flourishes perfectly well in Massachusetts, and as it is by his account the most valuable, it may be worthy of consideration whether we should not prefer it.—

From the American Farmer, May 19, 1826.

The Culture and Manufacture of Silk. [For the Report on the important resolutions of Mr. MINER, we are indebted to him and other friends in Congress. The impor-

tance of the subject is exposed and explained by the Committee, and the following pertinent observations by the Editor of the Albany Argus, leave us no occasion for writing even a brief introduction.]

"We confess that there is scarcely a branch of industry, which, in our judgment, can be rendered more productive, or in which home material and labour may be made more advantageously to supply the place of foreign production, than in the culture of silk and the ultimate manufacture of silk goods. The history of this manufacture in Great Britain, a sketch of which we published a few days since from the article on this subject in the last Edinburgh Review, exhibited very convincing results of its importance, both as a profitable application of labour, and as a source of national wealth and independence. Aside from any of the extrinsic circumstances, the fact that it affords employment and support to nearly half a million of persons, and is valued at nearly fifty millions of dollars, is a sufficient proof of the magnitude of the manufacture, and of its material connection with the public interests. The manner in which the attention of Congress has been at length turned towards the subject, shows that it is beginning to excite inquiry; and although the progress of any improvement in this way, must necessarily be slow, yet it is evident that it is not to be, as it has been, wholly neglected.

"The following report of the Committee on Agriculture, made to the House of Representatives, on Tuesday last, furnishes a mass of useful and highly interesting facts. The contrast between the amount of the importation of silks and the exportation of bread stuffs, is not less useful. Together, we trust, they will make such an impression upon the country, (whatever may be the course Congress may chance to pursue,) as will induce an early and steady experiment in relation both to the product and manufacture of this important article of industry and trade."

"Mr. Van Rensselaer, from the Committee on Agriculture, to which the subject had been referred, made the following Report:

"The Committee on Agriculture, to whom was referred the resolution of Mr. MINER, to inquire whether the cultivation of the mulberry tree and the breeding of silk worms, for the purpose of producing silk, be a subject worthy of legislative attention; and should they think it to be so, that they obtain such information as may be in their power respecting the kind of mulberry most preferred, the best soil, climate, and mode of cultivation, the probable value of the culture, taking into view the capital employed, the labour and the product, together with such facts and opinions as they may think useful and proper—Report:

"That they have examined the subject attentively, and have taken such steps as they thought best calculated to obtain information which might be useful and lead to satisfactory conclusions.

"The facts developed in the course of their inquiries, tend to place the subject in an important point of view. It is an interesting fact, that the mulberry tree grows indigenously throughout the United States, and that silk may be raised with facility from the southern to the northern boundary of the Union. Formerly considerable quantities of silk were produced in Georgia. In 1766, more than twenty thousand pounds of cocoons were exported from thence to England. The production of the article was suspended, not from any difficulty experienced in the process, but from causes connected with the Revolution. Measures have recently been adopted at Savannah, with a view to the renewal of the cultivation of the mulberry tree and breeding the silk worm. In Kentucky, the committee learn, that sewing silk is now produced in considerable quantities and of excellent quality. Many years ago the attention of public spirited individuals in Pennsylvania was turned to

the production of silk. The Persian mulberry was introduced into Bethlehem, Pennsylvania, by bishop Ettwein, where it flourished, and still flourishes. Silk was produced without difficulty. In Chester and other of the southern counties of that state, the experiment was also made with success. The great demand and high price of bread stuffs, owing to the wars growing out of the French revolution, rendered the cultivation of grain so profitable for many years, that the mulberry was neglected. In 1779, two hundred pounds of sewing silk were made in the town of Mansfield, in Connecticut: and in 1810, according to the report of the marshal who took the census, the value of silk produced in Windham county, was estimated at \$27,373. The committee learn that the production of silk is still attended to and found profitable. Some beautiful specimens of sewing silk, the production of that state, have been exhibited to the committee. Of the fact, therefore, that the United States can produce silk for its own consumption, and even to the extent of foreign demand, there appears no reason to doubt. There are few persons, the committee believe, even the most intelligent of our citizens, (who have not turned their attention particularly to the subject,) who will not be surprised at the view presented by the following official statement of the value of silks imported into the United States the last five years:

"Statement of the value of silk goods imported and exported in the years 1821 to 1825, inclusive.

YEARS.	IMPORTED.	EXPORTED.
1821, - - - -	\$4,486,924	\$1,057,233
1822, - - - -	6,480,928	1,016,262
1823, - - - -	6,713,771	1,512,449
1824, - - - -	7,203,344	1,816,325
1825, - - - -	10,271,527	2,565,742
	<hr/> \$35,156,484	<hr/> \$7,968,011

Treasury Dep't. Register's Office, April 26, 1826.

JOSEPH NOURSE, Register.

"What a bounty is paid by us to support the agriculturist and manufacturer of other nations, on articles which our country, with a few years of care, might supply! How important it is that the agriculturist should turn his attention to new objects of production, is very fully shown by the circumstance of the diminished and diminishing demand of bread stuffs abroad.

"In 1817, the exports of bread stuffs

	amounted to	\$20,374,000
In 1818,	" " "	15,388,000
In 1824,	" " "	6,799,246
In 1825,	" " "	5,417,997

"An importation of ten millions of dollars of silks; an export of five millions of bread stuffs! The facts speak the importance of the subject, and indicate the necessity that exists of awakening the slumbering agricultural resources of our country, by introducing new and profitable articles of production. Knowledge is power, in agriculture, no less than in politics; information is capital, and the means of valuable improvement. The committee conceive that the first and most important measure to be taken, is to acquire and circulate clear, distinct and precise information on these points: The relative value of the cultivation of the mulberry, and the production of silk, compared with other agricultural productions in the different sections of the Union, capital and labour being considered. The kind of mulberry best suited to the object; the most advantageous mode of cultivation; the most approved manner of managing the silk worm; and an explanation of the process till the article is ready for market. The committee incline to the opinion, that the best mode of raising silk will be for every farmer and planter to appropriate a small portion of ground, as for a fruit orchard, for raising the mulberry tree, calculating to produce as many worms as his own family will enable him to manage without increasing his expenses, and without permitting it, until the experiment shall have been fully tried, to interfere with the re-

gular course of his usual pursuits. A single acre planted with the mulberry will produce from £00 to 600 pounds raw silk, the value of which to the individual would richly compensate for the capital and labour employed, and the aggregate to the country be of great importance.

"The fact is worthy of notice, that notwithstanding the high price of land in Ireland, where a year's rent of land exceeds the price of the soil in many parts of our country, yet so valuable is the mulberry considered, that importations of trees from the Mediterranean have been made during the last year, for the purpose of producing silk. Your committee addressed inquiries to several intelligent gentlemen who were presumed competent to give them information upon the subject; and among the papers received in reply, they beg leave to present to the particular attention of the house, a valuable memoir, replete with interesting facts and useful information, from Edmund C. Genet, Esq.; and also several communications from other gentlemen, to whose attention the committee acknowledge their obligations. As the result of these inquiries, believing that knowledge on the subject is of the first importance, the committee submit the following resolution:

"*Resolved*, That the Secretary of the Treasury cause to be prepared a well digested manual, containing the best practical information that can be collected on the growth and manufacture of silk, adapted to the different parts of the Union, containing such facts and observations in relation to the growth and manufacture of silk in other countries as may be useful, and that the same be laid before Congress, at the commencement of their next session."

FROM MR. GENET.

Notes on the Growth and Manufacture of Silk in the United States.

"The various repositories of knowledge on agriculture

and horticulture, having extensively treated the zoological history of the *Phalera Bombis*, or silk worm, and the best methods of raising and multiplying the several species of the morus or mulberry tree, upon which that valuable insect feeds itself exclusively, I will confine myself, in these notes, to present only the principal facts and observations which may have a tendency to assist in the decision of the question now before the Agricultural Committee of Congress, viz: "If the growth and manufacture of silk is an object worthy of legislative attention and promotion in the United States?"

"This important question leads, in the first place, to ascertain if the latitudes of the several states are equally favourable to the growth of the silk worm and of the mulberry tree. In Asia, Africa, and Europe, the cultivation of that insect, and of that tree, flourishes from the 20th to the 50th degree of northern latitude. Under the same latitudes, the mulberry trees in the United States are indigenous; and as nature has appropriated every plant to the support of certain insects, we may conclude that the silk worm and its favourite tree, indeed the only tree upon which it feeds, would both prosper here as well as in China, Bengal, Mongolia, Hindostan, Asia Minor, Turkey, Egypt, Barbary, France, Spain, Portugal, Italy, and England, if it was encouraged as it has been in those countries.

"Latitudes nearer to the equatorial line than the 20th degree, and beyond the 50th degree, may, perhaps, with a great deal of care, be also enriched by the cultivation of silk; but it has generally been observed, that very warm southern winds, and extremely hot air, always make the silk worms sick, and frequently occasion their death; and that very long and severe winters, such as those experienced above the 50th degree of northern latitude, are also contrary to their propagation. A moderate temperature is the best for those delicate animals and their seed; and none, on that account, would be more congenial with their nature than the United States.

"That opinion is not grounded on analogy and presumption alone, it is supported by the strongest of all arguments, by actual experiment. Several industrious and ingenious females of the county of Rensselaer, in the State of New York, and many others, in the states of Massachusetts, Connecticut, Vermont, and New Hampshire, and very likely, though not to my knowledge, in other states, have made the raising of silk worms, and the drawing, spinning and twisting of sewing silk, an article of domestic management and trade; and that article, very well known in our markets, is preferred on account of its strength, if not of its perfect evenness, to the French, English, or Italian silks of the same kind. Handsome fancy goods have also been wove in combination with cotton, with silk raised in this country; and we have in New York, a small manufactory, where the handsomest waistcoat patterns have been produced at a much lower price than those that were imported.

"Having proved, by the preceding facts, not only the practicability, but the existing practice, of raising silk worms and silk in the United States, I will, in the second place, examine, if the raising of that commodity would be, upon a large scale, congenial with our mode of agriculture, and of our variegated population. This subject requires a subdivision of the United States, in relation to their two different climates, and also to the two better different methods of raising the silk worms in open air or in houses.

"The first method would, it seems, suit the southern states; and the second method the eastern and northern states.

"The cultivation of silk in open air is extremely easy in warm climates, and requires very little attendance. It is the most common in China, where the mulberry trees and the climate are so agreeable to the silk worms, that the quantity of silk produced in that way is incredible. The single province of Tchehiang might alone, it is reported, supply all China, and even a great part of Europe, with that commodity. Great quantities of silk, raised in the

open air, are also imported raw from the East Indies, in England ; but those silks are harsher and coarser, than those raised in houses—a circumstance which had made several authors believe that it was the production of a different insect called *Ser*, which was supposed to live five years, while the *Bombis* dies annually. But that fiction is now discredited, and the difference in the quality of the silk is more justly attributed to the effect of the oxide rays of the sun, equally operative on silk as on wool ; as it has been observed very advantageously by the Saxons, who owe, in a great measure, the superior fineness and higher value of their merino wool to the ingenious improvement of protecting their fleece with linen jackets against the rays of the sun. If, however, the silk and the wool raised in the air, and exposed to the sun, are harsh, they are more abundant than the silk sheltered from the radiant matter, and would, notwithstanding, become a most valuable article for the southern states. The eastern and northern states, on the contrary, would enlarge the cultivation of the housed silk worm, which requires greater nicety and vigilance, and a more attentive and judicious management.

" It seems that our two systems of agriculture agree with the two modes of raising silk. But if we can raise that commodity, a third question arises : will its growth be profitable, or offer greater advantages than the articles which now constitute the staple produce of the northern and southern states ?

" To answer that question, it will be sufficient to state, as a matter of fact, that the planting and attending the mulberry trees, either in orchards or hedges, to accommodate, according to the climate, the two methods above mentioned, is the hardest part of that branch of industry ; and that the rest of the process, which occupies only the fifty or sixty days to which the life of the silk worm is limited, may be conducted by females, children, and old or invalid men, unable to perform hard labour on any farm or plantation,

and will accordingly offer a new gain, without impairing the other sources of income. It is, besides, proper for legislators to consider, that the more the science of mechanics, applied to manufactures, substitutes machines to manual labour, the more it is useful to supply the females of our country, whose number is every where superior to the number of men, with the means of supporting themselves, or the families that support them, and that no occupation, besides the spinning of flax, and its manufacture, not yet entirely conquered by mechanics, seems to be better calculated to employ the time of that supernumerary part of the population, than the cultivation of silk.

"It will certainly be a great while before a sufficient quantity of silk can be raised in the United States to become an article of exportation, or to supply even the few silk manufactures of our own country, which now import the whole of their incipient materials. But, if the Italians, who first cultivated the silk worms in the year 1455, from seeds,* brought with a great deal of trouble and care, to Rome, by two missionary Monks returned from the East Indies, had been indifferent about the domestic growth of silk, valued at that time almost as much as gold; and if the French, the English, and all other European nations who have acquired wealth by the cultivation of that article, had not, by bounties and rewards, promoted, at first, its introduction, and afterwards protected its extension by various laws, no other silks, to this day, would be worn, but those imported from China and the East Indies. Comparatively speaking, we are now in America, in reference to silk, several centuries behind the other manufacturing nations. That commodity, whether we import it from India, China, or Europe, is for us an immense absorbent of our substance, and the sooner we prepare the means of stopping, effectually, that drain through which a great quantity

* This expression, however adopted in usage, seems to us to be incorrect. It means the eggs of the silk worm.

of bullion escapes from the vaults of our banks, the better it will be for the progress of our wealth and prosperity at home.

"The growth of the raw silk in a merchantable state, requires hardly any capital, and it occupies but very little land and very little room.

"An ounce of the seed of the silk worms will produce 40,000 worms, that will consume one thousand pounds of white mulberry leaves, easily supplied by fifty grown trees, or two hundred small ones, between two or three years old, from the seed or from the slip; and the produce in silk will be upon an average twelve pounds of drawn raw silk, allowing all contingencies.

"A small hedge that will occupy the twentieth part of an acre, being planted with bushes not more than three years old as aforesaid, will supply and accommodate 100,000 worms, the produce of which will be thirty pounds of raw drawn silk, and if the whole acre is planted in the same way, the produce will be six hundred pounds; which, if merely spun into sewing silk, would amount, at the present price of American sewing silk in Albany, to three dollars per pound, sixty feet to the skein, and one dollar and fifty cents per thirty feet.

"If the worms are housed instead of being raised in the air, it is reckoned that a square foot will contain, with ease, one hundred and ten worms in their maturity; accordingly, a shelf, twenty feet long and three broad, will contain 6,500 worms, its surface being equal to sixty feet; and a set of such shelves will accommodate the 40,000 worms produced by a single ounce of seed. These sets of shelves may be multiplied in the same room, observing only, to leave three feet opening between them, in order to enable the attendants to nurse the worms. Besides such a room, in which several millions of worms may be raised, it is sufficient to have an adjacent room or hovel to put the worms when they want to make them ball and spin their

silk; so that two rooms will be sufficient to raise an immense quantity of silk.

"There are several species of mulberry trees cultivated for the feed of silk worms; but the white, *Morus Alba*, seems to be better calculated for the northern climates than the *Nigra*, inasmuch as it is not affected by cold, while the *Nigra* is more liable to freeze. But the leaves of the *Nigra* are so much more rich and solid, particularly in the southern regions, than the *Alba*, that it is reckoned in France that one hundred pounds of *Nigra* leaves afford more food than three hundred of the *Alba*—and that accordingly one black mulberry tree is equal to three white ones of the same size. This circumstance would be much to the advantage of the southern states, and would enable them, with two-thirds less trees and ground, to raise the same quantity of silk, superior also in quality, the silk being always in proportion to the strength of the insect, and the strength of the insect in proportion to his food.

"The only thing that has stopped in England the progress of the cultivation of silk under the reign of James I. was the want of a sufficient quantity of mulberry trees. That culture ought then to precede any other improvement in the raising of silk in this country, as no dependence can be placed on the trees growing in the woods; and if it was the wish of Congress to promote the growth of silk among us, I should think that bounties awarded to the cultivators who should raise a certain number of mulberry trees from the seed, or from the slip in each state, as well as to those who should grow a certain quantity of silk in the ball fitted for market, and proportionately drawn and manufactured either in thread or cloth, would have a great tendency to urge the national industry.

"I should think further, that a well digested *manual*, containing the best practical information that could be collected on the growth and manufacture of silk, with descriptive plates and illustrations would be extremely useful to pro-

mote the desired object. I possess on those several subjects, very extensive French, Italian, and English treatises; and I should with pleasure, if it was thought proper, to entrust the reduction of that work to some able and patriotic economist, supply my contributions towards its completion."

E. C. GENET.

Albany, January 21, 1826.

Extract of a letter from Abraham Stout, M. D. to a member of Congress, dated

Bethlehem, Pa., Jan. 14, 1826.

MY DEAR SIR,

"In your letter of the 30th of December, you make particular inquiry, whether I had obtained any mulberry seed for you last spring. At the time you were here last spring, I was not aware that the flowers of the mulberry trees were all destroyed by the late and severe frosts which we have had: but soon after discovered that that was the case; consequently no seed could be obtained. But nothing is lost by that event. To raise trees from the seed is very tedious and objectionable. Our practical men agree with Forsyth, that the best and most expeditious way of raising a large number of mulberry trees, is from the cuttings; consequently, it was my intention to send you a large quantity of cuttings next March. From the size and number of trees which are growing in this vicinity, I think I can safely promise you four thousand cuttings; and should a further supply be desired, the above number can be obtained here annually. Although I do not pretend to give you a memoir on the mulberry trees, but from the little knowledge which I have of their growth, and the information which I have received from practical men in this town, I can assure you, that no tree of our forests, grows with more luxuriance than the genuine Persian mulberry does with us. They are growing here on elevated, gravelly regions, on

limestone soil, and bottom land with equal success. They are like a phoenix, they sprout from their ruins with an increased vigour. You might ask the question here, whether the mulberry trees in question, are the true kind, on the leaves of which the silk worm feeds? Of this, there is no doubt. The cuttings from which these trees were raised, were imported from Europe, by Bishop Ettwein, who has been largely engaged in that country, in silk establishments. After his arrival in this country, he cultivated the trees, and succeeded, beyond his most sanguine expectations, in breeding the silk worm, and manufacturing silk, equal in quality to the best China silk. We have two varieties here of the imported mulberry; one bears a purple, and the other a white fruit. Both are considered equally good, though some prefer the white.

"Bishop Eitwein's method of breeding the silk worm was extremely simple, and attended with hardly any expense. At the time his silk worms had arrived to maturity, and showed a disposition to deposite their eggs, he gave them large sheets of paper, upon which the eggs were lodged. The sheets were then rolled up, and loosely packed into a box, after which he closed the box, and kept it in a dry and cool cellar, where he let them remain until the following spring. As soon as the mulberry leaves had acquired a sufficient size to afford food enough for his worms, and the season so far advanced, that he was under no apprehension that the crop might be cut off by frosts; he then opened the box and laid the sheets into a room of the temperature of 70° F. In a few days, the small worms made their appearance. He now began to furnish them with the mulberry leaves, still keeping sheets of paper under them. When one part of the paper became soiled by the excrements of the worm, he put the fresh leaves upon a clean part, to which the worms immediately travelled for their natural food, which gave the Bishop an opportunity to clean the soiled spot with the plume of a feather. The

worms required this attention for thirty-six days; they then begin to enclose themselves, by forming cocoons. At the time the worms begin to spin, the Bishop gave them plenty of branches of trees, on which they formed their cocoons; and when they were too much crowded, he made paper cones, and put one in each, in which they began to spin. As soon as the worms had completed their cocoons, they were thrown into boiling water, and stirred with a stick; on the extremity of the stick, the ends of the silk became attached, from which the ends were collected, and reeled off the cocoons. The silk is then spun and prepared in the usual manner. I have omitted to mention, that the mulberry leaves must be thoroughly dry, before they are given to the worms, otherwise they will die. When I say dry, I mean free from moisture of either rain or dew."

Mansfield, Conn. Jan. 17, 1826.

DEAR SIR,

"Yours requesting information respecting the manufacture of silk, has been received.

"My attendance on the superior court has prevented an early reply. I have devoted yesterday and to-day to the subject, have consulted those who have had the most experience, and are best acquainted with the business; by which I am enabled to give you the following statement, which I think may be relied on as substantially correct.

"One acre of full grown trees, set one and a half rods apart, will produce forty pounds* of silk. The labour may be estimated as follows: For the first three weeks after the worms are hatched, one woman acquainted with the business, or children that would be equal to such person. For the next twelve or fourteen days, five hands, or what would be equal to five, if performed by children.

"In this period two men, with other help, would be em-

* The difference between this computed product and that of Mr. Genet is erroneous, and there must be an error in one or the other.

ployed to better advantage, than all women or children. This period finishes with the worms. For picking off the balls and reeling the silk, it will require about the same amount of labour for the same length of time as the last mentioned period, which may be all performed by women and children. The aforesaid labour and the board may be estimated at \$80; the spinning the silk, at \$34.

" Forty pounds of silk at the lowest cash price is now worth \$200—which makes the following result:

" 40 lbs. silk, at \$5 per lb.	- - - -	\$200
Labour and board,	- - - -	\$80
Spinning,	- - - -	34—114
which makes the nett proceeds of one acre,	-	<u>\$86</u>

" The principal part of the labour may be performed by women and children; but where the business is carried on to any considerable extent, it is considered more profitable to employ some men for the last period of the worms. The above calculation is made upon full grown trees. The prices at the lowest cash prices. On land adapted to mulberry trees they will continue to grow nearly forty years.

" But in a few years, (say ten,) they will be large enough to be profitable. In two or three years they are large enough to set from the seed; and the leaves may be picked every year after the year they are set.

" It is considered here that warm loam land, or land adapted to wheat and apple trees, is the best for mulberry trees.

" They will bear cultivation and manuring, which will increase their growth as much as any tree or plant whatever.

" Where the trees are in warm, rich land, the leaves are much thicker and larger, and the quantity and quality much improved.

" The quantity of silk manufactured in this town last year was about 3000 lbs., which was not considered an

average year on account of the extreme hot weather which commenced about the time the worms were beginning to wind, on account of which a great many died before they had completed their balls.

"I believe the foregoing answers all your inquiries.

"If any thing else should be wanted, I will cheerfully give you all the information in my power. As to the quality of the silk, there is no doubt of its being equal, if not superior to any imported.

"If the gentlemen of the committee wish to see a sample, I will furnish one if required.

"It is thought here by those best acquainted, that it is the best business to which land can be appropriated when the soil and climate are adapted to the trees, on account of the profit from the land, and on account of its furnishing a lucrative employment to so many women and children, whose labour could not be so productive in any other business. We hope Congress will afford us some encouragement.

Respectfully, your friend and obedient servant,

JOHN FITCH."

ON THE CHANGE, OR SUPPOSED CHANGE IN THE CHARACTER
OF FRUITS, BY THE FARINA OF OTHER VARIETIES OF THE
SAME FRUITS, IN THE SAME YEAR IN WHICH THE IN-
TERMIXTURE IS MADE.—BY J. L.

Whatever doubts may have been entertained as to the change produced in the seed by the introduction of the farina of one variety, or even of one species of vegetables, or fruits, into the flowers of another, (the stamina of the other having been first carefully removed) the question seems to be now settled by such a number of carefully conducted experiments, by different persons, in every part of Europe, that it will no longer be contested. When the point was once ascertained beyond doubt. the principle was applied

to every branch of horticulture; to flowering shrubs and plants as well as to fruits, and new varieties to an almost unlimited extent have been produced, which continue to be as permanent, as the varieties found growing naturally. New and entirely distinct varieties, heretofore unknown have been produced of gooseberries, currants, grapes, pears, and apples—of peaches, apricots, nectarines, plums and strawberries—not accidental varieties merely, such as were formerly obtained by sowing the seeds, or planting the stones of those fruits, but varieties, in some measure the result of calculation and judgment, produced by the impregnation of one variety of fruit with another, with the view to remedy a particular defect—or to communicate a hardy and vigorous constitution to a fruit, which was tender and weakly. The success of Mr. Knight, and Mr. Van Mons, in experiments of this sort is unquestionable, and furnishes sufficient ground of encouragement to those who have curiosity and patience sufficient to follow their meritorious example. I shall at the close of the present article insert some of the most remarkable cases of success in this course of experiments.

The object of the present article is however different: it is to introduce some evidence and some remarks upon a disputed question, and that is, whether the fruit itself, (not the seed of the fruit) is changed by the influence or effect of the farina in the *same* year in which it is introduced. There can be no doubt that anomalous cases of this sort do from time to time occur, but the question seems to be, whether they are not exceptions rather than general laws. Apples have been presented to our society, two in twenty years, one half of which was red, and the other a perfect russetting; and the difference of taste was as great; in another case a fruit, half of which was the woolly, and the other half the smooth peach or nectarine. In those cases they must be admitted to be sports of nature, because they stood alone on the trees, and were never repeated in subsequent years.

There are, however, two cases of a more remarkable kind and of a permanent character. The case of the apple cited by the Hon. Oliver Fiske, where the difference is constant; and of a pear tree owned by George Johonnot, Esq. of Salem, which bears two entirely dissimilar pears on different limbs. There is no direct proof, (though a probability) in either of these cases, that these anomalies are produced by impregnation by the farina of neighbouring trees; they seem rather to remain as single examples of deviation from the ordinary laws of nature. In the course of more than twenty years' pretty close attention to Horticulture, I have once or twice thought, I perceived the effect of the mixture of the farina in the different species of the melon, squash, and pumpkin tribes. It is among these, if any where, we should expect to find it, because they bear the fruit or female flower, and the male flower in different parts of the plant, and as the female must be impregnated either by the wind, or by insects, if the farina of a distinct variety, or species, should be introduced alone, it might be expected to affect the fruit, but even in this case, it must be doubtful, as we cannot be assured, that the seed itself had not been impregnated in a preceding year. The weight of evidence *in this case*, is certainly against the effect being produced on the fruit the *same* year, because there has been scarcely a year, for twenty years, in which I have not raised the pumpkin and the winter squash, on the same ground; and yet I have met with not more than one or two cases of decided hybrids or mules. But with respect to *other* fruits, the proofs that they are not affected by vicinity are numerous, and to my own mind, entirely satisfactory. White and red currant bushes are, with me, planted in squares, so near together, that they nearly touch each other, yet I never saw the least tendency to communicate their respective properties. In the case of the Antwerp raspberries, as they are very apt to run into each other, owing to the running nature of their roots, I have had the

white, and the red growing promiscuously in the *same stool*, yet I never saw the least variation in the fruit. As I found my estate filled with large pear trees of from 20 to 30 years of age, and many of the sorts were not valuable, I have grafted them with new varieties, and I have not less than 30 or 40 trees with two, and in some instances with three different sorts on the same tree; yet I never detected a single case of a pear, which was affected by the vicinity of the other.

My cherry and apple trees were planted without any regard to their difference of fruits. The estate having been confined as to extent; my father planted them so near, that their branches interlace each other. Yet each variety retains all its peculiar characteristicks, without a single example to the contrary, during the long period of forty years, since I have known the estate. I have some wall fruit, (nectarines) in which I have inserted other nectarines, and other woolly peaches, yet I never had a hybrid. My strawberries have often run into each other, yet the experience has been the same, so that I am constrained to believe, that the *law* is, that the change is produced in the *perfect seed*, and *not in the receptacle or drupe or pome, or berry*, and that the anomalous cases, which have often occurred in all countries, are only exceptions. I shall now insert some articles on the subject from foreign publications.

From the London Horticultural Transactions, Vol. V. page, 63.—Observations on the accidental intermixture of character, in certain Fruits. By JOHN TURNER, F.L.S. Assistant Secretary. January 16, 1820.

“In the course of the last season, several specimens of fruits came within my observation, in which a deviation from their true character was very perceptible. In remarking on the evident intermixture of colour, form and

flavour, which some of these fruits presented, I did not hesitate to ascribe it to the farina of one variety having come in contact with the flowers of another at a moment when the stigmas are in a proper condition to receive it : and on mentioning my opinion, was surprised to find, that the fact of such intermixture producing an *immediate* change in the fruit was generally doubted, and by many pronounced to be impossible. This led me to inquire, whether the subject had ever before engaged the attention of horticulturists, and not to go further back than the beginning of the last century, (though both Theophrastus and Pliny seem to allude* to it,) I found that the notion was entertained by Bradley, who, in his new improvements in planting and gardening, after giving directions for fertilizing the female flowers of the hazel with the pollen of the male says, “By this knowledge we may alter the property and taste of any fruit, by impregnating the one with the farina of the other of the same class, as for example, a codlin with a pearmain, which will occasion the codlin to last a longer time than usual, and be of a sharper taste ; or, if the winter fruit should be fecundated with the dust of the summer kinds, they will decay before their usual time ; and it is from this accidental coupling of the farina of one kind with another, that in an orchard where there is a variety of apples, even the fruit gathered from the same tree differs in its flavour and time of ripening, and moreover the seeds of these apples so generated being changed by that means from the natural qualities, will produce different kinds of fruit if they are sown.”

“In the Philosophical Transactions also for 1745, the subject is noticed by Mr. Benjamin Cook, in a paper “concerning the effect which the farina of the blossoms of different sorts of apple trees had on the fruit of a neighbouring tree. In this communication it is stated that Mr. Cook sent to Mr Peter Collinson some russetings changed by the

* Theophrast: Hist. Plant. l. ii. c. 4.—Plinji Hist. Nat. l. xvii. c. 25.

farina of a next neighbour, whose name he wanted skill to know, but could only say, the russetings had acquired his face and complexion. Mr. Collinson then produced several samples of the apples; an untainted russetting, a russetting changed in complexion which grew among a great cluster of unaltered brethren, and some apples of the other tree which had caused the change in the russetings, and whose fruit had in return received a rough cast from the russetings."

"A further proof of such intermixture taken place is also given by the same writer in the transactions for the year 1748, and again alluded to in 1749.

"Having thus shown, that the opinion now entertained is not a novel one, I shall proceed to mention the instances which I have observed. In the spring of 1819, I gave some carefully saved melon seeds of the netted succado kind to a friend near London. The young plants raised from these were injudiciously planted by the gardener in a frame with a larger and inferior variety. The fruits of the succado set well, but as they swelled they gave evident symptoms of having lost their true character, and when cut were found to be very worthless, arising, as I conceive, from the share which the inferior variety had in them."

[*Note by the editor.*] This first case cited by Mr. Turner of his own experience proves both too little, and too much. It proves too little, because, although the seed were carefully saved, the succado melon might by accident have been injured by impregnation the year before, and all admit, that in such a case the seeds will suffer; but it also proves too much, for it has been the practice of all gardeners, (time immemorial) to plant often in the same frame, and always in the same bed, when grown in the open air, from 2 to 4 or more sorts of melons. I never knew such an effect on the fruit, nor can it be common, as it would not have been matter of surprise to Mr. Turner's learned friends, as he admits it was: nor would it have been doubt-

ed, and pronounced impossible, as he declared they did. So far from it, it would have been a received maxim, that the vicinity of bad, ruins fine melons.]

Mr. Turner proceeds ; " In the autumn of the same year, I examined on the trees in Mr. Braddick's garden at Thames Ditton, an evident mixture of character in a cod-lin and the Ribston Pippin in more than one individual, on the sides of the trees next each other, while the fruit on the opposite sides was wholly untainted. The probability of such mixture taking place is great in Mr. Braddick's garden, owing to many varieties being grafted on the same stock, and to the closeness with which both the espalier and standard tree are planted." [The situation of Mr. Braddick's trees in this respect closely resembles my own, yet I have never seen such an effect produced. A friend of mine has an apple tree, every limb of which is grafted with different fruit, yet I never heard him intimate that he had ever perceived such an effect.—J. L.]

Mr. Turner proceeds ; " Early in the year 1820, Mr. Braddick sent to the Society, samples of two sorts of the preceding year's growth, which he had himself taken from the trees, and carefully presumed to show the extraordinary sport which they had made. The two sorts were the Holland Pippin and the white winter Calville, apples totally unlike in appearance; they grew on low standards near each other; two of the specimens gathered from the sides of the trees not contiguous, retained their natural character perfectly well, but the White Calville, gathered from the side of the tree next the Holland Pippin, had lost much of its own form and colour, and partaken largely of that of its neighbour, while the Holland Pippin taken from the side next the Calville, had become nearly a Calville in form and colour. In October of the same year, Mr. Brogden showed me two apples, in which a no less remarkable change had taken place. The one was a French crab, grown near a Ribston Pippin, the character of which it

had taken, and the other was a Golden Pippin which grew near a Russet, and in which the two varieties, though so widely different, were evidently blended. These several instances all coming within my observation in the course of two seasons, have fully satisfied me, that a change both in character and quality of fruits is frequently effected; it will be for the Physiologist to instruct us as to the mode by which it is done, and probably a close investigation of the subject may discover in this process of nature sufficient to account for the occasional appearance of a nectarine on the same branch with a peach. This indeed appears to me a more reasonable mode of accounting for such an anomaly than any which I have yet heard suggested.

"I have noticed these few facts for the purpose of drawing the attention of horticulturists to the subject, and I trust that those who have leisure and opportunities, will by *actual experiment*, endeavour to ascertain whence these occasional deviations arise. Such an investigation will not be useless; for if there does exist in fruits such a liability to change, it will at once be evident to the intelligent cultivator, how much care is requisite in growing melons, &c. &c. to secure their true characters, even without reference to saving seed for a future crop. Such experiments will, I doubt not, frequently succeed, if *made with care*, and on *large flowered* plants; on apples, pears, &c. it will probably be accident only that will give success."

There is abundant and wise caution in his conclusion, and it proves that he had not very sanguine convictions on the subject. Why should it so rarely succeed if it is a law of nature? That careful and numerous experiments have been made during a period of 30 years without one instance of success will be seen by the following note of Thomas Andrew Knight, Esq. President of the London Horticultural Society, to whom Mr. Turner's paper was referred for his opinion.

Note by the President, Hort. Trans. Vol. V. page 67.
Vol. IX. 18

"The Council of the Horticultural Society, having done me the honour to ask my opinion upon the subject of the foregoing paper, I beg leave to observe, that not having seen the varieties of fruit mentioned in it, I feel much less qualified to judge than those gentlemen who had opportunities of inspecting all the circumstances. The evidence given, however, is much more than sufficient to satisfy me most perfectly, that the variations in form and quality were as extensive as they are described to have been: and indeed I have stated in a former communication to the society a *much more* extraordinary circumstance of the same kind, in which a branch of the *yellow magnum bonum* plum tree bore *red* fruit, perfectly similar in appearance to the variety usually called the *red magnum bonum* plum. This occurred in *one season only*, after which the branch recovered its former habits. My garden *did not contain* the *variety last mentioned*, but *if it had*, I should *not be in the least inclined* to attribute the *change of colour and character*, which occurred to the operation of its pollen (or farina) for *I have in some hundred instances* (I can in truth say *some thousand instances*) *introduced the pollen of one variety of the Plum: the Pear, the Apple, the Cherry, the Peach, the Melon, and other fruits, into the blossom of others of very different and opposite habits*, and I *have never* (although I have most closely attended to the results) *found in any one instance*, the *form, colour, size, or flavour* of the fruit belonging to such blossoms *in any degree whatever changed or affected*. The fruit and seed coats in all cases which have come under my inspection are given *wholly* by the female parent (that is the one into which the farina was introduced) and the interior and essential parts of the seeds, those which constitute the future plant, are *alone changed* by the male parent, without which these I believe never exist. I therefore feel myself fully qualified to decide, that in the deviations of the fruits mentioned from their ordinary character,

the operation of the pollen of another variety was not the disturbing cause."

Such was Mr. Knight's conclusion, and a most logical and truly philosophical one it assuredly is, if philosophy is to be guided in natural sciences by facts, and experiments. It should be known by our readers, (though Mr. Knight does not here state it, his process of changing fruits being perfectly familiar to the Council of the Horticultural Society) that before he introduces the pollen or farina of a different variety, he carefully removes all the anthers of the blossom into which the foreign farina or pollen is to be introduced, and he does this before the flower expands, and before the anthers burst and discharge their pollen, so that he may be sure that the germ is not impregnated with its own farina.

The trial therefore is much more perfect, and the operation much better adapted to effect a change in the fruit, than in the few cases cited, yet in the thousand instances of his careful experiments, he never saw a change in form, colour, or quality! What then? do you doubt the well attested facts? No, but they must either be the result of some other law, of which we are ignorant, or the effect of an occasional and unfrequent sport of nature. At any rate, the case is of so rare occurrence, as not to justify the fears suggested by Mr. Turner, that fruits may be often injured from these causes.—It is worthy of remark, that the attention of the scientifick cultivators was called to this subject in the beginning and middle of the last century, yet no new light has been thrown upon it, and Mr. Turner freely avows, that it is now doubted and pronounced impossible; (not the fact, but the cause) by men of science in England, and we all know to what a high degree of advancement that science has now reached in Great Britain.

I have this season made two experiments according to Mr. Knight's method, by removing the anthers from unopened flowers and inserting the farina of another variety,

I have introduced the pollen of the Baldwin apple into a blossom of the little Pomme d'Api, and into a French Rennet which has a russet coat. If the fruit should grow, we shall at least have one experiment of our own. J. L.

Roxbury, May 16, 1826.

Some examples of the successful application of Mr. Knight's practice of "crossing the breeds," of fruits and flowers.

It is known, that the celebrated Father of Botany, Linnaeus, suggested the idea of the practicability of changing the character of the several varieties of plants by impregnation with the farina of others. It had been before known, that the inhabitants of Africa, and Asia, had been in the practice of fertilizing the germs of the female date tree, by transporting sometimes to great distances the farina of the male plants, and introducing it into the female flower. Mr. Knight however was the first, who, availing himself of the discovery of the sexual system, or rather the fact, that the pollen shed by the anthers of plants was essential to the perfect maturity of the seed, went into a course of ingenious experiments to improve certain fruits by artificial impregnation in which he has been eminently successful. To be sure the process requires great care, exactness and patience, and to the complete execution of such experiments, fortune and a thorough bred gardener are convenient aids, though not indispensable.

If Mr. Knight's success had only been proved by his own representations, men might have supposed that he was partial to his own productions, creations we may almost call them, but his own products have been generally submitted to the London Horticultural Society, a body eminently qualified to judge, and strict, and rigorous in pronouncing sentence.

Production by the new process.

In 1809, Mr. Knight sent to the London Horticultural Society, two dozens of a new apple, which he called the Downton Pippin. It was produced by introducing the farina or pollen of the Golden Pippin, into the blossoms of the Orange Pippin, and he thinks the fruit will be thought no very humble imitation of its male parent, the Golden Pippin. The Herefordshire Agricultural Society (Hereford is the greatest cider county in Great Britain) thought it an excellent cider app'e, and the hydrometer as well as the palate, indicates that its juice holds in solution a large quantity of saccharine matter. It is a tree of rapid growth, and a most luxuriant or prolific bearer. It ripens rather earlier than the Golden Pippin, but may be kept till March.

Mr. Knight expressed his hope soon to be able to send other new varieties of the apple, to supply the place of which have been cultivated, and of which the vital principle is nearly exhausted.

In the same year Mr. Knight succeeded in obtaining three new varieties of the Peach by the process of impregnation. By communicating the pollen of the Red Nutmeg peach to the stigmas of the French Mignonne he succeeded in giving the hardihood of the male parent while the fruit retained the other good qualities of the female.

He remarked, that he had no doubt, that in this way the tender peach and nectarines, which now in England require the protection of a wall, might be raised as standards.

In 1810, Mr. Knight made a communication concerning the practicability of raising by crosses hardier varieties of pears; "as he had more than once succeeded in combining the hardness and vigour of the Siberian crab, with the richness of the Golden Pippin, so he doubted not he should be able to combine the hardness of the Swan's egg pear with the valuable qualities of the Colman or Chaumontal." Having remarked that great manufacturing towns were

more healthy in seasons in which fruit abounded, he was solicitous to increase the number and quantity of pleasant fruits, he had therefore amused himself, with attempts to form new varieties of winter pears. In the spring of 1797, he withdrew the stamina from the flowers of a young and healthy Autumn Bergamot pear, and introduced the farina of the St. Germain. In ten years it bore fruit. Its form was spherical, eight inches in circumference, and it remained sound till December, shewing, that it had acquired some of the qualities of its male parent.

In 1811, Mr. Knight sent grafts to the London Horticultural Society, of six different new sorts of apples, to wit, the yellow and red Ingeströme Pippin. The Grange apple, and the Downton Pippin. The latter he observes is equally well calculated for the dessert, the press, and for culinary purposes, and he knew of no apple that could be brought to market with so much advantage, being a very early bearer. He sent also grafts of the Brindgwood pippin, which is an excellent winter apple; he believes it will prove valuable and productive. Another was also sent, called the Wormsley pippin, ripens in the end of October. It is very large, and in the consistency and juiciness of its pulp, it more nearly resembles the Newtown pippin of America, than any other apple with which he was acquainted.

The four first varieties above mentioned were obtained by crossing the Orange and Golden pippins, and the other from the Golden pippin and Golden Harvey.

In 1817, Mr. Knight sent to the London Horticultural Society, some peaches which he had raised by impregnating the almond with the peach, and he takes that occasion to urge his own opinion that they are but one species, and that the peach is but an almond improved by cultivation.

In 1818, Mr. Knight sent 18 new varieties of strawberries, all produced by his newly invented process of crossing, and he stated at the same time that his garden then contained 400 new varieties of strawberries, some very

bad, but the greater part tolerably good, and a few excellent.

He sent also a very early black cherry, produced by crossing, ripening earlier than the May duke, this must be valuable for that property.

Mr. Knight in 1818, sent a new plum, the production of the yellow magnum bonum plum and of the green gage. The secretary, Mr. Sabine, in his note says, that this new fruit was tasted at the general meeting of the Society, and was much approved. It seemed in its shape, colour and taste, to have partaken of both its parents. Mr. Knight produced three new varieties of cherries, in 1816. The Black eagle, the Elton, and the Waterloo, and four new varieties of peaches which are commended by the Secretary of the Horticultural Society.

We could extend this list much farther, but enough has been said to show that this is no idle speculation. Its principal value consists in your being able by this process to correct any particular defects in a valuable fruit. Thus Mr. Knight has succeeded in giving a hardy character to peaches, and been enabled to raise them to perfection in situations where they could not be made to ripen before.

Mr. Knight has not stood alone in this attempt to produce new varieties of fruits in this scientifick and artificial manner. He has been successfully followed by many intelligent cultivators, and not a year now passes without many valuable additions to all the varieties of fruits, from the noblest, the pear, to the smallest, the currant.

SOME REMARKS ON THE DESTRUCTIVE POWERS OF THE ROSE BUG.

The Trustees of the Massachusetts Agricultural Society having received from various parts of the State, in the summer of 1825, accounts of the extensive devastation and in-

jury produced by this insect, were induced to offer a premium to any person who should produce an essay on its natural history, and point out any probable means of checking their progress. No such essay has appeared, to our deep regret. We remain in ignorance, as to their mode of propagation, and the wonderfully sudden appearance of them in such clouds is left still unexplained. Having been a severe sufferer by them the last year, and a still greater one during the present season, I thought that an account of their appearance and progress and effects might not be useless.

The rose bug is not one of those insects, which, like the locust and the caterpillar or the slug worm appear in great numbers either at stated, or indeterminate intervals, and then wholly disappear. It is an annual and constant visitor, and this circumstance renders its occasional inundations, if I may use a metaphor, the more unaccountable, for we can see no apparent reason why it should not every year abound to a destructive extent. In ordinary seasons, the rose bug is seldom seen except upon the plant whose name it bears, and I never recollect a year in which the rose was not more or less injured by it, but it is rather a curious, though an unquestionable fact, that in the seasons in which it becomes a *general* scourge, it deserts the rose bush, and that plant almost wholly escapes uninjured. The rose bug is the most general feeder of any insect which I have ever known. The Canker worm attaches itself to the apple and the cherry, and when it is abundant, it will strip the American elm of all its foliage. The slug worm prefers the cherry and the pear. It rarely touches any other plants except the thorn, a cousin german of the pear. The common caterpillar prefers the apple, will take the cherry and rarely the peach, and leaves undisturbed all other plants, unless driven to it by famine. The rose bug is omnivorous. It eats with apparent relish, and it has destructively attacked not injuriously simply, but destruc-

tively, the cherry, the apple, the grape, Indian corn, pease, beans, the common potato, squashes, pumpkins, the sweet potato and the elm, besides its favourite, the rose. It attacks also meadow grasses, and in the summer of 1825, when my meadows were cut, they rose in such clouds, as to cover the hats, and clothes of persons employed in mowing them.

The first recollection which I have of the appearance of this insect in such terrific numbers, was in the year 1810. They then fastened upon my grape vines, and though I employed all my own hands, and hired additional labourers, they succeeded in cutting off the crop of grapes.

From that year, though they occasionally annoyed my grape vines, yet they gave me no anxiety, till three years since. I then discovered them in vast numbers, such as could not be described, and would not be believed, if they were described, or, at least, none but an ocular witness could *conceive* of their numbers, on a *russeting apple tree*, which stood *remote* from all others. The numbers on this tree were so great, that destruction by hand was out of the question. I put sheets under the tree and shook them down and burnt them. *Water will not drown* them. They can live in tobacco juice 12 hours, and will climb up the sides of the vessel and escape. Fire or crushing are the only remedies, unless our naturalists will discover how we may attack them in the egg, or in the larva, or chrysalis state. This single apple tree has been successively attacked for three years, and has been nearly destroyed by them. I mention this fact, because I think that it has some tendency, coupled with other interesting ones, yet to be stated, to show the *locality* of the evil, that the eggs are deposited in certain districts, which are contiguous, or convenient for the food of the future progeny. In 1825, they were abundant over all my grounds, but still I did not suffer much injury till about the 25th of June, when they took possession in *one day* of a bigarou cherry tree. (the large

white heart,) about fifty feet high, and loaded with 4 or 5 bushels of cherries nearly ripe. Their appearance was so sudden, that two days before, I thought of gathering the cherries, which were entirely fair and free from them. In two days after the examination I could not find a cherry, without two rose bugs upon it, and many had ten. The leaves of the tree certainly not less than 10,000 in number, were covered with them, were literally *alive* with them. In five days, the whole tree was precisely in the state in which the canker worms leave the apple tree ; nothing but the ribs of the leaves was to be seen. The tree fell a victim to it, as I expected. It was the most vigorous cherry tree I ever saw, and three fourths of it is entirely dead this year, and the residue must follow. This was the only serious loss I sustained last year. In the present year not a rose bug was visible on the 31st day of May. On the 1st day of June I gathered at 8 o'clock in the morning a mess of pease, and not a rose bug was to be seen upon the vines. At ten, I had occasion to visit those vines again, and they were literally swarming with rose bugs of *both sexes*, generally double, of full size, and no appearance of youth. I proceeded to kill them by *hand*, the only sure remedy. In three hours after, they appeared on some rows of bush beans to the number of some thousands. I killed them all, and as soon as I had gone through, I returned to see if any had escaped, and I found them *as full as before*. They appeared the next day on my corn, and to give some idea of their numbers, we killed 25 on one leaf, the corn being then only 6 inches high. They then attacked my young cherry trees, which they stripped in 12 hours. On one hill of corn, we killed 105 rose bugs, and there were not more than 12 or 14 leaves on the stalks, which were only 5 in number. It would be but a moderate computation to allow, that we killed 100,000 of them on a quarter of an acre. I followed them up for one week, every morning, and have nearly subdued them on that piece of ground. but they have yet three weeks to run, and

they may re-appear in greater numbers than ever. How do they propagate in summer? I can find no eggs. The yellow and black striped bugs which infest the squashes present the same difficulty: you see no eggs; they must be deposited in the earth, but *you see no young ones*; do they come forth full grown at once? No, this is impossible. Do they remain below the surface till they are full grown? I am inclined to believe it, as they are capable of living below ground, and always seek a refuge there, when attacked. It is not so with the disgusting squash bug, the companion and the friend of the yellow bug, who agree to *divide between them* this plant of our care. The yellow bug preys upon the leaf, the black triangular squash bug feeds upon the bark or cortex of the root and stem. This bug is easily destroyed. It is sluggish. It *places its eggs in open view* on the lower, or upper sides of the leaf, and the careful farmer or gardener will crush the eggs before they hatch. If he does not, his vines will be covered with the young squash bugs of all sizes and ages, and no state or vigour of the squash, the cucumber or melon, (even when the fruit is nearly ripe) is any security against them in dry seasons.

As we know that the squash bug lays eggs which produce, not larva, but the *perfect insect*, is it not probably also the case with the rose bug, and the yellow bug? Their incessant amours cannot certainly be without *production*, and their constant re-appearance for many weeks would lead us to believe, that they produce the perfect insect either viviparous, as does the *Aphis*, or from eggs, as the squash bug certainly does. No doubt all these points are settled, and were well known to Fabricius and Olivier, but unhappily those who have these treasures of knowledge keep them from us under lock and key. If the knowledge of the mode of propagation should not enable us to meet the evil and to subdue it, yet in our day of inquiry, it is agreeable to know the truth, and the whole truth, under the hope, that ingenuity will devise a remedy.—J. L.

ON THE LONGEVITY, OR DURATION OF VARIETIES OF FRUITS.

Is there any law of nature by which the duration of varieties of particular fruits is limited? The subject is a very important one, and it is comparatively new. Its novelty ought not to be an objection, in an age in which chemistry has unfolded so many wonders unknown to preceding generations, and in which the expansive force of elastic fluids has produced such changes in manufacturing industry, and in the management of ships. Let us approach this question fearlessly. A gentleman of Great Britain, now nearly eighty years of age, discovered what had escaped the philosophers of Europe, including Malpigi and Grew, two of the ablest physiologists; that the sap of trees ascended in the alburnum, and after furnishing the leaves with their sustenance, descended in the bark, and between the bark and the alburnum. This discovery, modestly announced by Mr. Knight, never since questioned, admitted by all, and proved to be true by numberless experiments, raised the reputation of this learned, though modest man, and he was soon drawn from his retreat in Shropshire, and made the President of the Horticultural Society of London, a Society, composed of some of the most intelligent cultivators of that nation.

Mr. Knight among other remarks, resulting from fifty years' experience, had taken notice of the fact, that certain old varieties of fruits were less productive, and the trees less vigorous than they had been heretofore. This fact which he announced as one familiar to all farmers in England was admitted at first to be *true by all*. It was a simple fact, which if *not* true, would have been at once denied; but so far from being denied by the five thousand enlightened gardeners and cultivators of England, Holland, and France, they have for 20 years admitted it to be a fact; and we shall show, that the only individuals who have

questioned it, have only doubted its *universality*, and have attempted to prove that there were some exceptions to it. The very attempt itself, feeble as it was, only proved the correctness of the general rule. Mr. Knight, who is no theorist, but a philosopher on the principles of Bacon, going no further than his facts would warrant, sought for a solution of the causes of this undoubted fact. He readily found one in the universal law, that all animated beings, with which we are acquainted have a youth and an old age, and die. An *individual* variety of the apple, for example, produced by seed, must of course die. Its duration is not precisely ascertained, and cannot be. Various circumstances may prolong its duration, but no man who has seen the progress of an oak, or an elm, can doubt that the individual has its appointed duration, that as it grew from a small beginning, so, it must decline.

The only question is, can this life be extended indefinitely, by artificial means, by grafts or buds? Let us carefully separate the question of facts from the theory. In what manner does a graft or a bud derive assistance from the stock into which it is inserted? Does the new stock alter its original character and qualities? The very ground of the process of engrafting proceeds upon the *principle*, that the essential characters are unchanged, and so is the fact. Setting aside the minor question, sometimes agitated, whether the stock does not affect in some degree the qualities of the fruit, it may be asserted, that the form of the leaves, the colour of the stalk, the appearance of the buds, the growth, whether upright or trailing, are all the same in the graft, as in the parent from which it had been taken. Put the Siberian crab on a cultivated winter fruit, it blossoms earlier, as early as its own parent, and produces a crab apple, in all respects similar to those produced on its parent. Reverse it,—put a large apple on a crab stock, and the scion will produce large fruit, like its parent. What then is the natural inference from these unquestioned

facts? That the stock furnishes the nutriment only, and does no more, than if you had obtained the same result by layers. It is difficult to conceive, indeed it is absolutely impossible to believe, that a *perennial character*, an ever during existence, can be given by a change so simple. We know in fact, that all the delicacy, and tenderness, and liability to disease which belonged to the parent plant pursues the offspring wherever inserted. I would say this with some qualification. If the parent stock had some peculiar disease arising from its location or any other cause, the graft may escape it in a new stock, but a graft taken from a healthy parent, which is subject to mildew, or to cast its fruit, or is in the habit of bearing every other year, or every year, will carry with it all these qualities. In truth the graft is nothing more than a prolongation of the stem of the parent plant, and is as much so after it is inserted in another tree as before, or if it had remained on its parent stock. Mr. Knight, looking around him, found all the old varieties of fruit failing, and he attributed it very naturally to old age. Those who oppose this opinion are bound to shew, that the allegations upon which his opinion was founded are not true.

It is experience alone which can decide the question, and it is of no small importance in this case, that the facts confidently asserted by him, were received by his contemporaries in Great Britain as true; and however great their respect for his opinion and character, they would have laughed at his suggestion, that the Styre, and the Golden pippin, and many others which he mentions, were failing, if they were in reality as vigorous as ever. While the writings of distinguished cultivators in England and Scotland furnish many incontestable proofs of the *admission* of Mr. Knight's solution of the causes of the decay of many valuable fruits, we have met with but two objectors, the Rev. William Williamson, and Mr. Loudon. We shall devote a few lines to both. Mr. Williamson, the most respectable of

the two, says "when we consider that the graft is but an extension of the parent stock, and therefore liable to all the diseases and defects of its original, and that most of our fruits have been cultivated by grafting during many years, it *seems reasonable* to conclude that they would, in common with every thing which has life, arrive at that period when they would begin to decline, and at last totally fail. It was therefore recommended by *several* skilful horticulturalists, to remedy this evil by raising trees from the kernels of the fruit, which, having a renovated existence, would be free from these defects. This theory seemed so reasonable that many were induced to adopt it; and so assured was I of its truth that I began to raise trees in this manner, fully expecting that though the fruit might not possibly be so good, I should at least possess a tree free from disease. In the course of a few years, however, I was greatly disappointed, in finding that *many* of these young trees, some only twelve months old, began to exhibit the same diseases, and to be affected in a greater degree than many of our oldest varieties. It is therefore evident that *old age is not the only cause of decay*, but that probably in *young* trees it arises from some external cause not connected with the plant itself; and I am induced to think that the great diminution of the ordinary warmth of our summer months for some years past, is the principal cause of the premature decay which I have described." Mr. Williamson then goes on to support his own theory by a course of remarks which have very little bearing on the present question. We solicit the attention of our readers to the following suggestions, in relation to Mr. Williamson's opinions.

First. Mr. Williamson admits the fact, as fully as Mr. Knight had ever stated it, that the old varieties of fruits were upon the decline, and that some remedy was required for the admitted evil.

Secondly, He admits, that the solution given by Mr. Knight was reasonable, and was agreed to be so by other

skilful horticulturalists; and he assigns the same powerful and natural arguments in favour of it, which Mr. Knight had done.

Thirdly, Mr. Williamson appears to have been singularly unfortunate in the treatment of his seedlings. Mr. Knight's seedlings have proved unusually healthy and vigorous, the *cold summer* notwithstanding. We can add, that all the new varieties of pears, cherries and apples sent by Mr. Knight to this country, have proved to be perfectly healthy and vigorous; much more so than our old worn out varieties: and lastly, Mr. Williamson seems to have overlooked one difficulty in his own theory. The cold summers would affect equally all the varieties of apples, yet there was no complaints that we learn, except with regard to the aged varieties, and Mr. Williamson's own seedlings. Mr. Williamson's remarks were made 18 years since, and were admitted into the transactions of the Horticultural Society; yet they appear to have produced no change in the opinions of the members of that Society. Mr. Knight's sentiments seem still to have their former influence on opinions and practice.

Mr. Loudon, a professed author, has expressed his doubts of the soundness of Mr. Knight's theory; but he admits the fact that the old varieties are diseased and declining; and the only argument he adduces against the theory, is the production of certain examples, in which the old varieties seem yet to flourish.

There is no attempt to show that Golden pippins are *generally* restored, or the Styre apple used as a cider apple extensively, but that individual cases can be found in which they still flourish. This Mr. Knight not only anticipated, but constantly repeated,—that in favourable situations, and by a change of soil, worn out varieties might be made to endure, he would not say how long.

So far for British opinion and authority. What is the experience of America?

It is to this country, in an especial manner, that a man desirous of investigating this subject would look. We had no indigenous apples or pears of any value. The natives or aborigines had no good varieties of any fruits in possession. We imported our apples, pears, cherries, plums, and peaches, from Europe. Our country has not been settled by Europeans, for a longer period than is assigned by Mr. Knight and others, for the average duration of varieties of the apple, and a shorter period, than that, which they allow for the pear.

We can scarcely conceive of a stronger proof than is furnished by *our* experience of the truth of Mr. Knight's doctrine on this subject.

We have at this moment in New England, not one variety of apple common in France or Great Britain, except the Pearmain,* which is much diminished in quantity, and almost extinct; and except varieties, introduced within fifty years, directly from England and France, and chiefly confined to the gardens of Amateurs and Horticulturists. How has this happened? Why are not our apples the same as those we see in Covent Garden and in Herefordshire? We assert the fact, that they are not, from our own knowledge: We did not recognize in the English or French markets, any apples which were known to us. Our Roxbury Russetting, our Baldwin apple, our Rhode Island Greening, our Newton pippin, and our Spitzenberg, are equally strangers there, and found only in the gardens of the curious. When this fact shall be either disproved or explained, Mr. Knight's doctrine may be more successfully attacked. For ourselves we are astonished that *we* should not have been the first discoverers of the doctrine. The disappearance of all the old English apples, and the appearance of new varieties far superior to any, which France or England can produce, ought to have taught us, that fruits are perishable, and must be renewed. The case of Mr. Parsons's Golden

* We consider the Golden pippin, a garden apple

pippin, is an exception only. We have tried the Golden pippin more recently, and it is as diseased as they represent it.

As to peaches, they are so constantly reproduced by planting, that we can scarcely trace their history in our country. One American variety, however, which was superior to any European one, has *become extinct*, or at least we know of no tree still surviving. Yet great pains were taken to preserve it.

Of the old European pears it may be safely asserted, that they are on the decline with us. We speak from knowledge; we remember them in their prime, and we perceive their decay. *Individual exceptions there are*, but who will deny that the Chaumontelle, the Virgoulouse, the St. Germain, the Summer and Winter Good Christian, and the St. Michael, are not *generally* in a diseased or desperate state? Our own new varieties are healthy, vigorous, and prolific. On the whole, therefore, we are inclined to believe that Mr. Knight's doctrine is true, and that it is our interest to seek new varieties, if we would enjoy what some of our predecessors did, abundance of good fruits.

The writer of this article has suffered too deeply from cultivating worn out varieties, not to be solicitous to procure, and to propagate new ones. J. L.

REVIEW.

Review of the third volume of the "Memoirs of the Board of Agriculture of the State of New York." Published by authority: Albany, 1826.

A work on the subject of agriculture, proceeding from some of the most enlightened cultivators of the first Agricultural State in the Union, cannot fail of being interesting to all those parts of the United States, whose soil, climate, and culture, bear any resemblance to those of New York. Although in some important respects, New York differs

essentially from the New England States, especially in the superior fertility of its soil, and its adaptation to the growth of wheat, yet in many other respects there is a great similarity. New York is a great grazing state, raises to advantage, cattle, both for the butcher, and the dairy, and is at the same time, one of the greatest wool growing States in the Union. In these respects, her interests are the same with those of New England. New York and New England are therefore equally interested in all questions, which regard the provision of more abundant and cheaper food for cattle and sheep. Hence the qualities of the different sorts of grasses, the best kinds of roots for winter fodder, and the most profitable mode of raising, keeping, and expending them, are questions alike interesting to us both. No apology therefore can be necessary for introducing to the attention of our farmers this very interesting volume, nor shall we be censured, we presume, for making copious extracts from it, since the expensive form, in which it appears, places it beyond the reach of most of the farmers of New England. There is a most essential difference between the cultivators of New England generally, and those of New York, in regard to their means of procuring works on the subject of agriculture.

The farms in New York are generally much larger than those of New England, and the class of farmers in easy circumstances, far more numerous in the former. The volume in question is both in matter, and execution, superior to most of the publications, which have appeared in our country, on the subject of agriculture, and we feel deep regret in learning, that this volume will close the labours of the Board of Agriculture in that State. From what adverse or unpropitious causes, whether from prejudice, or false economy, the State of New York should have withdrawn its patronage at a moment, when from the volume before us, a most intelligent and enlightened spirit

had been excited, it would be difficult for us to divine, and improper in us to discuss.

If any State in the Union was under deep obligation to take the lead in encouraging a more intelligent and scientific mode of agriculture, New York certainly was that State. Its means are not only much greater, but its influence and example were of the greatest weight. Our readers, who do not own this work, and they are probably nine tenths of the whole, will be better satisfied with an account of its contents, than with any extracts from foreign publications which we could lay before them.

The first paper, which we beg leave to introduce to the notice of our readers, is a letter from Mr. Featherstonhaugh, of Duaneburg, to the Hon. Stephen Van Rensselaer, of Albany, on the subject of the imported breeds of horned cattle. To enable our readers to judge of Mr. Featherstonhaugh's capacity, and means of judging on such a topic, we would state, that he was originally from Great Britain, and intimately acquainted with British agriculture. Having many years since settled in this country at Duaneburgh, in the State of New York, he has devoted himself to agriculture, and especially to raising and improving the various breeds of cattle. Upon a question of so much moment, and on which there has been already so much controversy, it seems to us to be important, that such a testimony as that of Mr. Featherstonhaugh, should at least be laid before the farmers of New England. Every person must be sensible, that the whole natural weight of prejudice must lie *against* the imported breeds. It would require the united efforts of all the intelligent part of our farmers to overcome these prejudices. We felt its force against the merinoes, and nothing, but the surest of all tests, the prices of their wool, could have overcome the strong prejudices against them. We do not pretend to say, that the improved horned cattle of Great Britain, can produce as conclusive proofs of their superiority, as the merinoes

have done, as to the several races of sheep, but we do say, that the experiment has not yet been fairly tried, and we think, that we ought to give it a much better chance, than we have as yet done.

Of this, we are convinced, that the importation of foreign cattle has been of great benefit to our stock generally, and that it is the surest, and most ready means of creating an interest in the subject. We are persuaded, that so far as the improved foreign stock *has been tried*, it has materially increased the value of our native breeds; partly by crosses, and partly by producing an attention, greater than we paid before to our native stock.

Letter from Mr. Featherstonhaugh, of Duaneburgh, to General Stephen Van Rensselaer, dated December 2, 1825.

SIR.—Having now had an opportunity of examining some of the calves got by that magnificent bull *Champion*, imported by you in the summer of 1824, I sit down with much pleasure to communicate to you, as you have desired, my opinion of the relative value of the improved short horn stock, with the other breeds of cattle known to us here.

So many individuals of that blood have within the last ten years been brought from England into this, and into some of the neighbouring states, and their descendants are now so widely spread, that opportunities for observation and comparison are becoming very abundant in the vicinity of the coast; and even offer themselves, although partially as yet, in the interior.

I have upon different occasions availed myself of the increased facility for observations of this nature; and with the aid of my own personal experience in this and other breeds of English as well as of our native cattle, do not hesitate to say, that I have seen many individuals of the pure blood of the improved short horns, which have descended from imported stock and their progeny, in no manner degenerated from the fine animals they sprang from: and their mixed

progeny, got by short horn bulls upon the finest American cows, as far as they have fallen under my observation, *and have been taken proper care of*, surpass any of the native or mixed breeds I have yet seen in the United States. I am aware that warm controversies have arisen on this subject amongst us, which was the case in England for a while. The owners of the stately short horns have been accused in both countries of pressing their favourite stock into notice ; and the Herefords and Devons, to say nothing of others, have taken the field against them. Public opinion, however, on the other side of the Atlantic, as far as I am acquainted with it, appears to be decidedly in favour of the short horns. Every year seems to bring them an accession of patrons, and to strengthen the opinion that it is a breed "*which renders the most money in the shortest period of time.*"

In expressing this sentiment, I know that I subject myself to the charge of a partial leaning to them, as it is known I commenced the importation of them into this neighbourhood many years ago. Nevertheless it is true, that near twenty years ago, I began to breed with the greatest care from the native cattle, and certainly with that comparative success which accompanies a careful attention to matters of every kind. My bulls were talked of, and my cows were much finer than those of my neighbours, who continued to breed promiscuously. As soon as I could get into good blood, I began with the Devons, which in a few years eclipsed my old stock. The Devon stock is very beautiful : I have always admired them, as I think every one must do. I now possess a great many individuals of that breed ; and although I look at them with pleasure, I should be more satisfied with them if they were all pure short horns ; not because these last are more beautiful—they are too large for that expression—but because I think, combining all their qualities, they are the most valuable race of cattle I have seen. The persons, therefore, who are opposed to short horns, appear to depart somewhat from liberality, when they insinuate that

the proprietors of that breed are in all cases biassed in the preference they express. There is no ground for imputing insincerity to men whose deliberate judgment is formed from a careful experience. A man who institutes a fair experiment with the various breeds of cattle, and comes to the same conclusion which men of greater experience and knowledge than himself have before arrived at, deserves to be thought sincere.

In a letter addressed by me in March, 1823, to Mr. John Hare Powel, on this subject, and contained in the 2d volume of our Memoirs of the Board of Agriculture, I observed—“Take one short horn with another, no breed is more valuable for its milk, or keeps in better condition under the same circumstances, or goes to beef at less expense, or furnishes more money and manure in a given time.” I am now entirely confirmed in that opinion. At every stage of their growth, if they are well taken care of, they appear to me to be, under similar circumstances, comparatively worth much more money than any other breeds I am acquainted with.

When you apprised me of the arrival of your fine bull Champion last summer, I availed myself immediately of your kind offer, and sent one of my short horn cows to him. She brought a bull calf on the 5th of May last. He has been raised from the pail, from his mother’s milk. We have raised six other bull calves of different breeds, who have sucked from their birth, being requested they should do so by those who gave orders for them; and at this moment he is worth nearly twice as much to the butcher as any of the others. He resembles his sire in most of his points, and is the best calf we have ever had. But what have we to compare with the early maturity of this breed for beef? An ox of this breed at four years old, if well taken care of, will weigh as much as, under similar treatment, I have been able to make the finest oxen do, raised from other breeds, and which have never done a day’s work, at six years old.

Those who keep a large stock, can best understand the advantages of turning off stock at four years old instead of six ; but even this pre-eminent characteristic of the breed has furnished objections to some persons, who exclaim against the excessive fat of these “ pampered giants.” I admit that a slice of beef on a plate, with an edge of coarse fat six inches deep, does not tempt a delicate appetite, especially when it is known to come from a monster gorged with oil-cake, and weighing 2500*lbs.* Yet all tastes are not alike, and practical farmers know very well that the chief recommendation in the eyes of a butcher is the fatness of an animal. As far as my experience goes in the sale of cattle, I can truly say that I have not sold many I should have been glad to part with, because they were lean ; and that I never met with any difficulty in selling a fat animal, even if it was an old cow. Persons who keep up what is called a genteel table, do not introduce coarse legs of Bakewell mutton with six inches of fat; nevertheless the lower classes take off greater quantities of that sort of meat than of any other. There is a greater demand for it in England than for any other, and in time it will be so here. The labouring classes, including the mechanics, in the cities and villages adjoining my residence, consume very little pork : they find a great convenience in purchasing joints of small fresh meat ; and the fatter it is, the cheaper they consider it to be. Thus, whatever theories or opinions may intervene, all circumstances seem to conspire to encourage the farmer to raise a stock that will become very fat at the least expense, because *quick sales enable him to get the most money out of it in the shortest period of time.* In reasoning about these matters, then, it ought always to be remembered, that the practical farmer ought to look to the tastes of the great mass of his consumers, and in fact he does so.

I would, however, be doing injustice to that valuable quality of the short horns, early maturity, to say that there is any thing disgusting in the meat of their steers at four years

old. We all know that the ordinary ox beef, which has been worked until six or seven years, or later, and afterwards stall fed, is frequently hard and veiny, furnishing a very unsatisfactory dish to the table. The meat of the short horn steers, however, which has been steadily kept up, and has received a little extra attention the fourth winter, is as large as an ordinary ox of eight years and larger, but is extremely tender, and has no veins. When such meat shall become abundant, for at present the animals are too valuable to emasculate often, there is every reason to believe it will be preferred, and that the breed will be popular here as it has become in England.

To recapitulate the finest qualities of cattle, would be to write over what has so frequently been written. This breed is approved of because it is thought to afford a greater quantity of beef, tallow and milk, than any other in the same time, and is remarkable for its early maturity. The cows are deemed to be fine average milkers, equal to any breed, and drying easily from milk to beef. As long, however, as they maintain their present size, which will be, I think, as long as they are done justice to, I must continue to entertain an opinion before expressed by me, that the oxen can never make profitable labourers. The Devons are so light, and tight, and smart, that nothing gets over the ground like them: and if the beautiful New England cattle, which compensate to the community in muscle and activity for the want of other propensities, had the pains taken with them the first two or three winters which we do not hesitate to give to young colts; if they had something better than skim milk given to them, were stabled in the winter, taught to hold up their feet, and broken to quick paces; they might, for all farming purposes, be substitutes for horses, and save a great deal of money to the farmers. I should think it would be worth any farmer's while in New England, to select some of the best bred steers, and educate them with that view. This ought to be done soon;

for the gentlemen of Massachusetts have, with their accustomed spirit, imported many valuable bulls of the short horns, and their descendants may be expected to give the natives a general cross before twenty years have passed away.

As to any contemplated improvement of the New England cattle, which may ever be supposed to stand in the place of the conspicuous improvements we have derived from England, I cannot imagine any attempt desirable, if it is intended to be prospectively exclusive, nor indeed do I understand it to be so. A venerable and much honoured person, who at the age of eighty still delights, with a yet vigorous mind, to offer to his countrymen the benefits of his great experience, has incidentally found occasion to advise the farming interest of New England to turn their attention principally to their native breeds of cattle: he has thought that greater effects might be produced in that direction, than by waiting for the improvements, which it would take half a century or more to effect by foreign crosses. I have not used exactly his words, but have intended to observe the strict sense of them. I do not desire to enter into the controversy, satisfied that the motives on both sides are, at bottom, connected with the public interest. Feeling all the respect which that venerable person's character inspires, I reluctantly express my difference in opinion with him on this subject, because my name has been mentioned.

Would it be justifiable in us to reject what is at hand, and which we know to be good, when we have no security that any effectual steps here will either be taken or persevered in? What is the extraordinary improvement of animals in England owing to? To the perseverance of professional breeders. What has encouraged breeders to persevere, and to succeed? The use of free capital, and the most extensive markets. These three things I take to be essential to the successful improvement of animals,

where the subjects are the unimproved native races. Extensive markets, such as a great manufacturing island affords, must exist, or improvement will be measured by the limits of the sphere it moves in; and a free capital must be in the hands of the improvers, or they will not be able to avail themselves of the resources which are indispensable to the success of their object. Now as respects this country, I would ask where are these extensive markets? Where this free capital applicable to agriculture? Where all that skill and experience requisite to give effect to the labours of a professional breeder?

What is the reason that the farming interest has been so much depressed here at all times? I submit, it is to be found in the stage of society where we exist at this moment, and which is sufficiently marked by limited markets far distant from each other, by an almost entire want of free capital applicable to agriculture, and by a corresponding deficiency of skill and experience. It was to remedy these obvious circumstances, which had so long kept down the landed interest, that the legislative enactments of our legislature in favour of agriculture were carried into effect; the fruits of which, through private enterprise and general emulation, are universally acknowledged. To no period of my life do I look back with so much satisfaction, as the six years during which I have had the happiness of co-operating with you in a disinterested and strenuous exertion for the benefit of the farming interest. The effects of the constant, cheerful, and munificent support given by you to that interest, during your long presidency of the Board of Agriculture of this state, will never be effaced. You never hesitated to countenance the improvements of older countries, or to doubt the wisdom of possessing ourselves of all their improvements in husbandry and rural economy; the only certain direction perhaps in which private enterprise, under our circumstances, can move.

Who has ever doubted the policy of availing ourselves of the great example of England in her acknowledged pre-eminence in science, arts, and literature? Why should there be any hesitation in adopting her substantial improvements applicable to the farming interest? They have been a long while at it in that country; the experiment has succeeded with them: the success of short horns is complete there. Were we at this distance, and under all the acknowledged disadvantages of our husbandry, to say, without even having seen what is going on in England, that they are in error, and that it is all to do over again; that we ought to begin the experiment here, it would be contrary to good sense and propriety. If any thing had been wanting to make my mind up entirely on this subject, the sight of your superb bull, and of his stock, would have confirmed my confidence and admiration of the short horns.

Champion is the finest animal I ever saw; and your heifer Conquest, fully justifies the encomium passed upon her in her pedigree. Mr. Powel has, I understand, received of late many additions to his short horn stock, which I have not seen: if he has any equal to the two above named animals, he must have the finest cattle stock in America. It is very pleasing to witness on all sides so many efforts to enrich the agricultural interests here. In most cases, too, they are made by gentlemen who are not governed by selfish motives. You have already the satisfaction of having extensively diffused in your neighbourhood the most valuable of all the breeds of cattle, with your accustomed liberality; adding thereby to the numerous motives which men already have to remember you with unfeigned satisfaction.

I remain, dear sir,

Very respectfully, yours,

G. W. FEATHERSTONHAUGH.

The next article which we shall insert from the "Memoirs of the New York Agricultural Society," is one upon the cultivation of grasses and the improvement of grass lands, by the Hon. Judge Buel. No apology can be necessary for the insertion of this article entire. The deep interest which New England Farmers have in this subject, and the known ability, industry, and practical skill of the writer, are sufficient reasons for inserting it in our work, which will reach many readers, who will never have an opportunity of seeing the book from which we borrow it. We are sorry, that the limited finances of our society will not enable us to insert the engraved plate, giving sketches of the various kinds of grasses, and we shall omit the table of experiments borrowed by Judge Buel from the appendix to Davy's Agricultural Chemistry.

We do this with less regret, because we concur in the opinions expressed by a writer in the New England Farmer, page 353, Vol. IV. signed, "Examiner," as to the very imperfect nature of the experiments, of which this table exhibits the erroneous results, and we are satisfied, that so far as Judge Buel's remarks on the value of the different sorts of grasses are founded upon the supposed accuracy of these tables and experiments, they must be received with much caution and allowance.

We are the more readily induced to insert Judge Buel's remarks, not only because we would wish that our cultivators should see all sides of the questions, in which they are so deeply interested, but because the insertion of them will give us an opportunity to give our own experience, when it happens to be in opposition to the opinions of this respected cultivator.

We shall do this in a preliminary sketch before we introduce the essay itself.

I. The first grass mentioned by Judge Buel is the anthoxanthum odoratum of botanists, or sweet scented vernal grass. The writer remarks upon it, that it is a grass of di-

minutive growth ; this is true, but it should have been added of extraordinary thickness, or in other words of very considerable burthen. The writer says, that by the table of experiments annexed to Davy's Agricultural chemistry, it is not worth cutting for hay. That table gives, upon an experiment made on a very limited patch of four square feet, about one ton per acre of this grass, when *made into hay*, and states its soluble matter, which he assumes to be a test of its nutritive properties, at 122 pounds per acre, while the *poa pratensis*, or our common spear grass, gives 279.

We have had 20 years' experience of this grass. It forms the principal crop of a drained natural meadow, and it is found with the meadow foxtail and clover in small quantities. In some parts of the meadow, the sweet scented grass forms nine tenths of the whole. It gives about one ton and an half to the acre, and the hay made from it is extremely grateful to cows, and keeps them in better condition than any hay we know of. It has one disadvantage, when mixed with other grasses. It ripens ten days earlier, than any one of all, with which it is mixed. But as soon as the seed is ripe, it gives a second crop in six weeks, which in favourable years, will be nearly equal to the first, and in September it will furnish an after feed for cattle, till it is des rood by frost. Happy are those farmers into whose lands it naturally comes. It is shy of uplands, rarely appearing upon them, but is found on the edges of wet meadows, and will form, in spite of you, the chief crop on meadows which are thoroughly drained. We have no faith whatever, in the result of chemical experiments on the value of grasses. We are persuaded that animals may be made fat and kept so, on grasses, which by the table in question are pronounced useless. If such natural meadows were to be broken up and sowed anew, perhaps the meadow foxtail and other tall grasses would be more profitable than the sweet scented vernal grass, but we believe,

with the English Farmers,* that such *natural* meadows should never be disturbed, but only enriched by manure, and no manure is so efficacious for such lands as pure horse dung. They will produce as much as can be dried upon the ground, with a good dressing once in two or three years.

II. We entirely concur in the praise given to the meadow foxtail, and we should earnestly recommend it to any farmer about to lay down a well drained meadow. It is early, produces a great burden, and is in all respects a valuable grass. It is not to be procured in our seed shops, but it is found in almost all our meadows. How it is to be obtained except by importation, we do not know.

III. The smooth stalked meadow grass, is very valuable. It comes into our ground, whether we wish it or not, and forms the great basis of upland sward. It makes the best hay we have, but the burden is light. It is, however, a great blessing to us, since when the artificial grasses run out, this always takes its place in New England.

IV. We have had no experience of the rough stalked meadow grass; it does not abound in our meadows.

VI. The orchard grass is getting into great favour with us. We are happy to find such testimonials to its value from the south. We are convinced, that for early or late pasturage, it is far superior to the timothy or herds grass, and for the sake of our dairies, we should be rejoiced to see it more frequently sown. We can say from the experience of our neighbours, that it may be cultivated to great advantage.

VIII. Tall meadow oat grass.—On this subject we have some experience. We make very light of his grace the Duke of Bedford's experiment, as to its nutritive qualities. It is consumed with eagerness, while fresh and dry, by horses and cows. We were induced to try it, twelve years

* An English Country gentleman assured us that they made it a condition in their leases that natural meadows should not be ploughed.

since, by the high eulogium bestowed upon it by the late Justin Ely, Esq. See the Massachusetts Agricultural Journal.

We sowed it on a light gravelly knowl. Its seeds vegetate badly, and it requires therefore a liberal hand in sowing it. It proved an early and excellent grass, gave very fair crops, but it went out rather sooner than herds grass, and in five years not a spire was to be seen. We should, however, strongly recommend it for trial on good dry land, and that it should be broken up the fourth year. Its after math, or rowen, is abundant. We think it only inferior to the orchard grass, among the new grasses. We are persuaded that it is preferable to herds grass for dry early soils. Such soils are usually moist enough, till this grass is fit for the scythe.

IX. Rye grass is a great favourite in England, and we have known one highly successful trial of it here.

The late Mr. Smith, of Dorchester, had a field of it, which flourished and gave great crops for many successive years. We know of no other experiment, and of course the evidence is entirely in its favour, as to its adaptation to our climate.

XVII. Lucern. This grass has never had, so far as we know, more than one fair trial, and that was a very successful one. There was a field of it at Dorchester, which bore for several years, excellent crops.

We received a pint of the seed four years since, from the Agricultural Society at Florence in Italy, under the name of Lupinella. When it came to flower, we knew it to be Lucern, and a member of the Florentine Agricultural Society, having seen it growing on our grounds, said it was the Lucern, known by them under the name of Lupinella. This grass stands our winter well, tethers well, covers the whole ground, is earlier than clover, and much taller and less liable to lodge. Cut while in bloom, it is eaten eagerly by cows, it starts again even earlier than clover, will

rise a second time, to the height of two feet, and ripens its seeds well in the second crop. It is perennial, shows no symptoms of decline in the fourth year, and we are resolved to sow an acre of good land with it the next season, being convinced that it will well endure our climate, and that for soiling and for pasturage it is admirably fitted for small dairy farms. We do not know that it will not answer for more extensive ones. It certainly merits a fairer trial than it has yet had with us.

XIX. Sainfoin. This is a favourite with the French farmers. We have tried it repeatedly, and we venture, without hesitation, to say, that it will not endure the winters on the sea coast of Massachusetts, and think it our duty to warn our fellow citizens by stating our experience.

These are all the grasses mentioned by Judge Buel, (except the familiar ones of herds grass and the clovers) of which we have any experience sufficient to enable us to speak.

There is in some of our meadows a large proportion of a most excellent grass, which appears to us to be the meadow fescue. It is not so tall, but much thicker than the meadow fox tail. From what we have seen of it, we strongly recommend it for low grounds, wet in spring, but dry in summer; if the land be not thoroughly drained, the carices and other coarse meadow grasses will overpower it. With us, as soon as the low meadows are drained and manured either with dung, or pure sand, the carex disappears, and the meadow fescue as we call it, for it agrees in its character and appearance with that, and the sweet scented vernal and the meadow fox tail take the place of it. We recommend to our readers Judge Buel's classification of the grasses as adapted to different soils.—J. L.

On the Cultivation of Grasses, and the Improvement of Grass Lands. By J. Buel, of Albany.

The enterprize of men of capital, stimulated by the zeal for improvement which our agricultural associations have called forth, has done much to improve our farm stock, by the introduction of the most valuable breeds of animals found in Europe. The last cattle show held in this country, afforded a gratifying evidence of this fact, particularly the exhibition of bulls, which was probably superior to any ever before witnessed in this state. It consisted of three imported Durhams, or short-horns, of uncommon beauty and excellence ; and eight or ten others, of fine symmetry, principally the progeny of short-horns, Devons, and other approved breeds, *imported since the institution of our agricultural fairs.* Our flocks of sheep have been meliorated by the fine fleeces of Spain and Saxony, and the heavy carcases of the English South Downs and Leicesters. Indeed, the data afforded at our cattle shows, connected with the interest which has been awakened in this branch of our husbandry, seem to warrant the conclusion, that in ten years, the aggregate value of our domestic animals will be from 30 to 50 per cent. above what it was in 1816. But in order to reap a full harvest from the seed which has thus been sown—to prevent the fine breeds of Europe from deteriorating among us, and to enhance the value of our native stock—it is necessary to increase our means of *keeping them well.* This can best be done by turning our attention more to the culture of roots, and to the improvement of our meadows and pasture grounds. My present remarks will be confined to the last branch of this subject.

We do not find, in our publications on agriculture, but very little information on the subject of grasses : Indeed, the names of our native kinds are scarcely enumerated, except for scientific classification ; much less are their habits described, or their relative merits for hay and pasture

pointed out, in any American work which has fallen under my notice. A considerable portion of our lands is unsuitable for convertible husbandry, that is, an alternation of grass, grain and roots. Of this description are our stiff clays, our marshes and swamps, and all those lands in which tillage is rendered difficult by reason of hardpan, stones, or habitual wetness. These should be appropriated for hay and pasture; and it is of the first importance to the farmer to know what grasses will render them most conducive to profit. A custom still prevails, of leaving arable lands, when they become too much exhausted for grain crops, or are wanted for pasture, to the slow and precarious process of a spontaneous growth, unaided by grass seeds of any kind. Under this reprehensible practice, the soil yields comparatively only a pittance of food, is still further impoverished, and becomes a nursery for daisies, thistles, and other pests to good farming. Would it not conduce to profit—as it certainly would to fertility—to sow clover seed with small grains, on grounds intended to be continued in aration the subsequent year? From a partial experiment, I think the fall feed, and the fertilizing effects of the lay on the next crop, doubly compensate for the cost of the grass seed. The soil is withal cleaner of weeds than when left naked. That our grass lands are susceptible of great improvement, by a judicious selection of seeds, and suitable management, must be evident to every person of reflection and observation, who contrasts the naked stubbles and lean pastures which too often meet the eye, with the rich, luxuriant herbage which cultivated grasses afford.

To inform myself on this subject, I have examined several foreign works, and such American publications as I could find upon grass husbandry; and have collected many facts which I consider useful to the American farmer. I submit them, with the observations which my own experience in farming has enabled me to make, in the hope, that

they may prove useful, at least by drawing attention to the subject, and eliciting, from abler pens and more experienced heads, the information which we need in this important branch of farming.

The experiments upon which they are grounded, were carefully made by George Sinclair, on soils best adapted to each kind, under the direction, and at the expense, of the Duke of Bedford, at Woburn, England. The great contrast which these experiments exhibit, in the product and nutritive qualities of different grasses, cannot but surprise those who have never examined the subject—the former varying from *five to one hundred and eighty-six* ounces on four square feet; and the latter, from *one to five and three quarters* drachms in sixty-four of hay.

We shall proceed to state what we know of these grasses severally, so far as the interests of practical husbandry are concerned, in the succession in which they stand in the table, which is the natural order of their coming into flower.

1. *Sweet-scented vernal grass.* This is a grass of diminutive growth, and, it will be seen by the table, is not worth cultivating for hay. It is nevertheless considered valuable in pasture, on account of its affording very early feed, and growing quick after being cropped. We are advised by Muhlenburgh, that it delights in moist soils; by the Bath papers, that it does well in clayey loams; and by Dickson, that it grows in almost any soil, including sands and bogs. It is eaten by horses, oxen and sheep, though not so freely as some other grasses are.* The seed of this grass is sold by seedsmen in New York and Philadelphia.

2. *Meadow fox-tail*, possesses all the advantages of early growth with the preceding, and is much more abundant in produce and nutriment, but is not so well suited to different soils. It almost invariably constitutes one of several kinds

* Davy's Agricultural Chemistry.

which are sown together by the English farmers, for pasture; and affords, withal, a tolerable crop of hay. "Of all the English grasses," says Dickson, "it appears to be the most adapted for cutting twice."* It shoots very rapidly after mowing or feeding, and produces a plentiful aftermath. It does best in moist soils, whether of loams, clays, or reclaimed bogs. It abides nine or ten years. Sheep and horses have a better relish for it than oxen.† "It abounds in seed," says Middleton, "which is easily collected from the swaths during mowing time." Eaton says this grass grows in Pennsylvania and about New York; yet it has been considered of foreign origin—and we have never heard of the seed being offered for sale in our shops. It would be an undoubted acquisition to our husbandry.

3. *Smooth-stalked meadow grass.* This is indigenous in this neighbourhood, and I believe in all the northern states. It comes in spontaneously upon dry soils, as cultivated grasses fail, and upon the sides of roads, paths, &c. and is generally known by the name of *spear grass*. The stalk is sometimes used in the manufacture of grass bonnets; and to the poisonous properties of the ergot upon it, has been ascribed a fatal disease among neat cattle. It affords a pretty early, and often a luxuriant foliage. Oxen and horses eat it freely. Both Sinclair and Dickson say it exhausts the soil in a greater degree than almost any other kind of grass. "The roots being numerous, and powerfully creeping, become in two or three years completely matted together: the produce diminishes as this takes place."‡

4. *Common or rough-stalked meadow grass*, is a native of the northern and middle states. It resembles the *Poa pratensis*, or *spear grass*; but while the *Poa trivialis*, according to Dickson, delights in moisture, and in situations that

* Farmer's Companion, vol. 2, p. 622.

† G. Sinclair.

‡ Farmer's Companion, vol. 2, p. 623.

are sheltered, the spear grass is chiefly found in dry pastures. On drawing it between the fingers, *this* feels rough, while the other is smooth. It is, however, suited to good moist loams and clays, and it multiplies much by seed as well as root.* On grounds suited to its growth, which Salisbury denominates low wet soils, consisting of heavy loams and clays, it seems to possess, he says, all that is necessary for either pasture or hay.

5. *Purple fescue grass*, appears to be worth cultivating, and is withal a native plant; but we have not been able to identify it: nor do we know that the seed is to be procured in the United States.

6. *Rough cock's-foot*. Dr. Muhlenburgh and President Cooper concur in pronouncing this the *orchard grass* of the United States; yet the orchard grass which we cultivate, does not correspond with the figure of the *Dactylis glomerata* given in Dickson's Farmer's Companion. Arthur Young, who has the credit of having first successfully turned the public attention to the cultivation of grasses in England, speaks in high commendation of this grass, and he took much pains to induce the farmers to substitute it, with clover, for rye grass. Its good properties consist in its early and rapid growth, and in its resistance to drought; but all writers agree, that to obtain its greatest value, it should be kept closely cropped. Hence it is peculiarly adapted for pasture. Sheep will pass over every other grass to feed upon it. "In some parts of Norfolk, it is called *cow's grass*, from their being very fond of it." It has been known to grow "four inches in less than three days." "I have cultivated this grass on a large scale for many years," says Young, "and found it to be of great use. It is a most valuable grass when kept close fed."† Although it is classified among American grasses, we do not find it in this vicinity, except where it has been introduced by man. It is con-

* Farmer's Companion, vol. 2, p. 624.

+ Young's Survey of Norfolk. p. 269

siderably cultivated in the neighbourhood of Philadelphia ; where, according to Cooper, it is gradually taking the place of timothy. It is well suited to mix with clover, not only because it is fit to cut as hay, with clover, but because it fills up the ground, and forms a sod as the clover runs out. Col. Powell, of Pennsylvania, a breeder of fine animals, a gentleman of science, travel, and nice observation, says, "I have tried orchard grass for ten years. It produces more pasture than any artificial grass I have ever seen in America."* My own practice and observation warrant the high encomiums above quoted in favour of this grass. In July and August last, I made a movable calf-pen, 13 feet square ; in which two calves, 10 to 12 weeks old, were confined in a field of orchard grass. The pen was removed twice a day on to fresh feed, and the grass uniformly fed close. The growth was so rapid that the feeding might be repeated, on a good bite, every fifth day.—Its cultivation is becoming every year more extensive among us. It is suited to all arable soils. It abounds in seed, which is easily gathered ; but on account of its peculiar lightness, (the bushel weighing but 12 to 14 lbs.) the seed should be spread on a floor, and sprinkled with water a day or two before it is sown, that it may swell, and more readily vegetate. Sow two bushel on an acre, with barley or other spring grain. The seed sells in the shops at \$2.50 and \$3.00 the bushel.

7. *Sheep's fescue grass*, has not been introduced among us. Although it affords but a small product, it is generally sown as a pasture grass in England ; and all stock, particularly sheep, are said to thrive upon it. It grows upon all soils, even in dry situations where other grasses cannot be made to succeed.

8. *Tall oat grass*. Dr. Muhlenburgh, and Mr. Taylor of Virginia, place this at the head of good grasses.† "On the continent of Europe, in comparison with common

* See American Farmer, 1823.

† See Dom. Encycl. Cooper's revision, art. Grasses.

grass, it is found to yield in the proportion of twenty to two.”* Dr. M. says, it is, of all others, the earliest and best grass for green fodder and hay. The Doctor was probably not advised of its deficiency in nutritive matter. It possesses the advantage of early, quick and late growth, for which the cock’s-foot is esteemed; tillers well, and is admirably calculated for a pasture grass. I measured some on the 20th June, when in blossom, (when it should be cut for hay,) and found it four and a half feet long. The latter math, it will be perceived, is nearly equal in weight, and superior in nutritious matter, to the seed crop. Sinclair says it thrives best on a strong tenacious clay;† and Muhlenburgh prefers for it a clover soil. Dickson speaks well of it; says it makes good hay, but is most beneficial when retained in a close state of feeding. My field experiments with this grass have not been as successful as I expected; owing partly to the seed not vegetating well, and partly, I suspect, to the soil (a light sand loam) not being sufficiently strong and tenacious. The seed is apt to fall, unless gathered early and with care. It may be sown at the rate of six or eight pecks to the acre, with grain, in the spring or fall. The seed is sold by Thorburn & Son, New York, at from three to four dollars a bushel.

9. *Rye grass*, is extensively cultivated in Scotland and the north of England; and where cock’s-foot has not superseded it, is generally mixed with clover seeds. It is rather declining in the public estimation. It does well in pasture; and as it contains much nutriment, is considered valuable for cows and sheep. Dickson says it does best in rich moist meadows. Young does not speak well of it. I have sown it twice. In both cases, but a small portion of the seed vegetated. The seed may be procured at New York, at three to four dollars a bushel.

* Dickson, vol. 2, p. 628.

† Code of Agriculture.

10. *Hard fescue grass*, according to Smith, is a native of this state, though we have not known of its being cultivated among us. It is an early and productive grass, with fine foliage; well adapted for being combined with other grasses for pastures, and by some is said to constitute the best hay.* Curtis says it stands the driest soil equal to any grass. The individual, or society, who should bring this and other native grasses into cultivation and notice, would confer an important benefit upon their country.

11. *Meadow fescue grass*, is a native of England. It has much the appearance of rye grass; to which, however, it is greatly superior, as being more productive both of foliage and nutriment. It is strictly perennial and hardy, thriving in all situations, wet or dry.† It produces an abundance of seeds, which are easily gathered, and grow readily. Salisbury says, "No plant deserves more the attention of the farmer than this; it being of certain growth, easy culture, productive, and remarkably sweet."

12. *Crested dog's-tail grass*, is also a native of Britain, and forms one of the pasture grasses on dry grounds. Although its product is small, it is highly recommended as a wholesome and favourite food for sheep.

13. *Tall fescue*, although a native grass, has not fallen under my personal observation. It stands highest, says Davy, according to the experiments of the Duke of Bedford, of any grass, properly so called, as to the quantity of nutritive matter afforded by the whole crop, when cut at the time of flowering; and meadow cat's-tail (timothy) grass affords most food when cut at the time the seed is ripe.‡ It grows naturally in wet grounds, in bog meadows, and on the sides of ditches, often to the height of four or five feet. Our ignorance of agricultural botany, and of the intrinsic value of this grass, can alone have prevented

* Dickson, vol. 2. p. 626.

+ Dickson, vol. 2. p. 624

‡ Ag. Chem. p. 324.

its being more generally known and cultivated. It must be very valuable for wet grounds, as from its rapid growth it is calculated to smother or keep down the coarser kinds which naturally abound in those situations. I am unable to say whether it affords much seed, or where the seed can be procured.

14. *Meadow soft grass.* This is a native grass of our country, and grows on most soils; but Sinclair says it is disliked by all sorts of cattle. "The produce is not so great as a view of it in fields would seem to indicate; but being left almost entirely untouched by cattle, it appears to be the most productive part of the herbage. The hay which is made from it, from the number of downy hairs which cover the surface of the leaves, is soft and spongy, and disliked by cattle in general."*

15. *Floating fescue grass,* grows about New York and in Pennsylvania, generally in marshes and swamps, and is probably among the best natural grasses found in those situations. We do not find that it has been much propagated by artificial means.

16. *Red clover.* There are many species of the *trifolium*, and several varieties of red clover. Whether the kind we generally cultivate is the *pratense*, or not, I am unable to determine. The character of red clover as a meliorating and fertilizing crop, is too generally known to require illustration. It cannot be depended upon for permanent grass lands; though it yields to no grass in value for alternating with grain, in convertible husbandry. It formerly was as indispensable in a course of crops in Norfolk, England, (which has been considered pre-eminent for good tillage,) as turnips; and the maxim then was, and still is, "no turnips no crops." But it appears from Young's Survey of that county, that it cannot now be depended on oftener than once in from eight to twelve years. Trefoil, white clover, cock's-foot, ray grass, &c. are therefore alter-

* Ag. Chem. p. 320, note.

nated with red clover in the grass years. There is reason to believe that neither red clover, nor other grasses, will bear repeating for a course of years upon the generality of soils. They exhaust the ground of the peculiar nutrient required for their support. In Great Britain, white clover, trefoil, rye grass or cock's-foot, are generally sown with red clover seeds: from twenty to thirty pounds of seeds are sown to the acre. In the northern states, timothy is generally sown with clover, though it is evident from the table that the mixture is an improper one for hay; for the clover is fit for the scythe ten or fifteen days before the timothy has attained to maturity. In the southern part of this state, and in the middle states, the small or early variety is cultivated. It is preferred for hay, and the second crop yields an abundance of seed. Red clover is probably the most fertilizing green crop which can be turned under for grain. Its hay adds much to the Indian corn crop, and is also fine for wheat. If sown alone, from eight to sixteen pounds of seed should be put on an acre: more on old than on new land.

White, or Dutch clover, (*Trifolium repens*.) is considered, in England, of importance to husbandry, if we are to judge from the great quantity of its seed which is there sown annually. With us, many districts produce it spontaneously: but it is too seldom sown. It shrinks greatly in drying, and does not contain as much nutritive matter as red clover; yet its value as a pasture grass is universally admitted. Its increase is very much facilitated by a top dressing of gypsum, lime or ashes.

17. *Lucern*, although affording much more green food, contains less nutrient in a single crop than red clover. It must, however, be borne in mind, that it grows much quicker than clover, and will bear cutting twice as often. In the soiling system, an acre of lucern will keep four cattle or horses from the 15th of May to the 1st of October. I cut a piece in 1823, about the 15th May, and again about the 20th June, to feed green; and then ploughed the ground.

and cropped it with ruta baga, which yielded sixteen tons the acre of roots, as fine as I ever saw. Mr. Fowell, (see Young's Norfolk, p. 345) derived a clear profit of £13 17s. 4d. per acre from his lucern, fed green to working horses. This is almost equal to \$60 the acre. An idea has prevailed, that it will not thrive in this latitude, (42—3°;) but the experiments of the late Chancellor Livingston,* and of

* In the first volume of the Transactions of the Society for the promotion of Agriculture, Arts and Manufactures, we find a detailed statement of a series of experiments made by the late Chancellor Livingston, in 1791 to 1794, in cultivating lucern; most of which were unsuccessful. He sowed it, mixed with clover seeds, and by itself, on a variety of soils, at different seasons; and with oats, wheat, barley, buckwheat and turnips. These experiments warrant the following conclusions:—That this grass should be sown on a dry, deep, rich soil, in May, when the earth is sufficiently warm to excite a rapid vegetation; that from 16 to 20 lbs. of seed should be sown on an acre, and the ground harrowed and rolled; that “it is full as hardy as clover,” and “better braves the biting frosts of the spring, and the keen autumnal blasts, than clover or any cultivated grass of this climate;” that the profits of an acre, in one experiment, after deducting every expense, exceeded \$17.50 per annum; and that the third year, when the plants had attained their full vigor, the profit was augmented to \$28 the acre. The following is Chancellor L.'s account of the expense and product the third year—this experiment being made on the fourth of an acre :

“ 1st April—Manured with 10 loads of black earth from a swamp; or at the rate of 40 loads to the acre.

“ It was very luxuriant, and cut twice before the 20th June, for plough-horses kept in the stable—being, when they began to cut each time, about sixteen inches high; the average height, taking the first and last cutting, each time about 20 inches. On the 24th July, cut and made into hay, produced one thousand weight, or two tons to the acre. On the last of August, cut a fourth time; produce 600 wt. or 2400 wt. to the acre. The fifth crop is not cut, but is now, the first of October, 20 inches high, and very promising in its appearance. If we have no severe frost before the middle of this month, it will produce about 600 wt. of hay.

Produce and Expense per acre of No. 1.

40 loads of black earth from an adjoining swamp, at 1s. per load, L. 2 0 0	2 0 0
Cutting five crops, and making them into hay, at 8s.	<hr/> L. 4 0 0

Tons C.

Two first crops, valued at 500 wt. hay each, or	2 : 0
Third crop in hay,	2 : 0
Fourth crop in do. . . .	1 : 4
Fifth, estimated at	1 : 0
	<hr/>
	6 : 4

Le Ray de Chaumont, prove otherwise. I sowed seed in 1821, at the rate of 6lbs. the acre, with barley. It has stood the winters well, much better than clover; and has been in a state of progressive improvement: drought has not affected it. I sowed fifteen pounds to the acre last spring, broad cast, with winter rye. I have cut it once, and subsequently fed it. The seed took remarkably well, and the grass has now a very promising appearance. The plants are very tender the first year; and require either a very clean tilth, or to be kept free from weeds and grass with a hoe the first year. It should have deep loam, as it sends down tap roots five or six feet; and it is equally necessary that the subsoil should not be wet. It may be sown either in drills or broad cast, with or without grain. Fifteen pounds of seed are required for the acre if drilled, and twenty is not too much if sown broad cast. It abides from eight to twelve years. To the proprietor of a dairy, an acre or two of lucern would be valuable, to be fed to cows, in addition to ordinary pasture. The seed may be procured at New York, at from 30 to 40 cents the pound.

18. *Long-rooted clover*, is a native of Hungary, and has probably never found its way across the Atlantic. The root is biennial, and, if sown in fall, lasts only during the next season. It penetrates to a great depth in the ground, and therefore is but little affected by drought: it of course requires a deep dry soil. The produce of this plant, when compared with other clovers, is uncommonly great. It affords twice the weight of grass, and double the nutritive matter, that is given by the common red clover. It gives abundance of seed; and if the ground be kept clean of weeds, it sows itself, vegetates and grows rapidly, without covering in, or any operation whatever. "Four years it has propagated itself in this manner, on the space of

6 tons 4 cwt. at 2s. 6d.	.	.	.	L. 15 10 0
Expenses above,	.	.	.	4 0 0
		Profit,		L. 11 10 0

ground which it now occupies, and from which this statement of its comparative value is made.”*

19. *Sainfoin*, is peculiarly adapted to calcareous soils, on which it is a valuable grass to alternate with arable crops; and according to Dickson and Young, it will succeed on no other. It is cultivated upon the sands of Norfolk, it is true; but it is to be borne in mind that those soils have all been dressed with clay marl; and should we imitate the practice of the Norfolk farmers, and apply the blue clay, which almost every where underlays our sands, to the surface, these soils would not only grow sainfoin, but would be greatly improved for every other purpose of husbandry. This marl is composed of lime and clay, which improve the texture of the soil, and greatly increase its fertility. Young says it is “one of the most valuable plants that were ever introduced into the agriculture of Great Britain.”† Mr. Coke cultivates 400 acres of sainfoin, and sows it at the rate of three bushels an acre, without other seeds. It is extensively cultivated upon the Cotswold hills, which are calcareous. It is mown or grazed ten years; and the like period intervenes before it is sown again in the same field.‡ The attempts which have been made to cultivate sainfoin in the United States, have hitherto, so far as our knowledge extends, been unsuccessful; partly, we believe, from the soils upon which it was sown not having been adapted to its growth, and partly from the imperfect quality of the seed, which seldom grows after it is a year old.

20. *Timothy*. This grass is distinguished in Great Britain by the name of *meadow cat's-tail*; and in New England, by that of *herdsgrass*. The table shows that it is one of the most nutritious grasses which are cultivated; while our experience teaches that it is peculiarly adapted to our cli-

* Ag. Chem. p. 65, appendix.

† Survey of Norfolk.

‡ Marshall's Account of Gloucestershire.

mate, and to the wants of every description of farm stock. And it should not escape the observation of the farmer, that it affords *more than double* the nutriment when cut in the seed, to what it does when cut in the flower. In tenacious, strong and moist soils, it is entitled to a precedence, perhaps, over any single grass for meadows. Yet, for the reasons already stated, it is not suitable to be sown with clover seeds, for hay; while the small product of the aftermath in our dry hot seasons, compared with that of some other grasses in the table, places it low in the catalogue for perennial pastures. Another consideration which renders this grass particularly worthy of cultivation, is the seed which it affords, and which may be saved without materially deteriorating the hay crop. From ten to thirty bushels of seed may be taken from an acre of timothy; which, at the price it now bears, is of itself a handsome remuneration.

22. *Fiorin*, has of late years been brought into notice in Great Britain, by the persevering and meritorious exertions of the Rev. Dr. Richardson, who particularly recommends it for mountainous districts, where ordinary grasses will not flourish. It requires a moist soil, and does well on cold clays and bogs. The peculiar value of the fiorin arises from the concrete sap stored up in its joints. It suffers less diminution of bulk and nutriment by frosts, than any other grass; and of course, is best adapted to supply pasture throughout the year. The fiorin is propagated by stolons, or roots; the ground being previously drained, and meliorated by one or more root crops. The surface is made smooth and clean; the strings are then strewed over it, and a compost, consisting of parts of bog ashes, lime and loam, spread over, sufficient to prevent the roots being blown away. We have a statement in the Edinburgh Farmer's Magazine,* furnished by James Baird, of the expense of

reclaiming a moss, and laying it down in fiorin, and of its product. The expense was from 12 to 14*l.* (53 to 62 dollars) the acre; which was more than compensated by the grass of the first year, the acre yielding from five to seven tons. Cows fed with 16*lbs.* (of 22*oz.*) of fiorin per day, gave 40 per cent. more butter than when fed with potatoes and straw. Dr. Richardson has cut his thirteenth crop, without any falling off in quantity. Several attempts to cultivate the fiorin in the United States, have failed, probably for want of the labour and attention requisite in preparing the ground. There are several of this family of grasses which grow naturally in the United States. Couch, squitch, or quick grass, is a variety of the *Agrostis stolonifera*, according to Davy's Appendix. Others come in spontaneously on bog grounds, on their being drained and pared. We witnessed an instance of this last fall, on a vly or marsh below Kinderhook landing, and east of Nutten Hook, on the farm of Mr. White. The marsh had been pared and drained only the preceding spring and fall; yet the grass was thick and luxuriant. A flock of fine Devon cattle were depasturing it: their good condition evidenced the nutritious quality of the grass.

23. *Upright bent grass*, (*Agrostis stricta*.) Dr. Muhlenburgh considers this the *herdsgrass* of the southern, and the *foul-meadow* of the eastern states;* and that *white-top* and *red-top* are varieties: while, according to Eaton's Manual, the white-top is the *Agrostis alba*, and the red-top the *Agrostis vulgaris*. We shall leave this difference to be settled by botanists, contenting ourselves with stating, from Davy, the product, in hay and nutriment, of an acre in each, according to the experiments of the Duke of Bedford.

* Dom. Ency. art. Grasses.

	lbs. hay.	lbs. nutritive matter.
<i>Agrostis vulgaris,</i> .	4764 . .	251
<i>palustris, (Sy. alba,)</i>	4594 . .	438
<i>stricta,</i> . . .	2713 . .	175

The *white-top* and *red-top* are natives of our country, and are valuable for hay and pasture, on grounds adapted to their growth, which are reclaimed swamps and moist swales. Seed may be procured in almost any town, by permitting the grass to come to maturity. It is sold, under the name of *herdsgrass*, at Baltimore, at from \$2,50 to \$3,00 the bushel.

24. *Flat-stocked meadow grass.* This, according to Muhlenburgh, is the blue grass which is considered a pest in much of our tillage land. The small crop which it gives, and the little nutritive matter which this affords, although it is a native grass, shows that it should not be depended upon for hay or pasture.

25. *American cock's-foot.* This is put down in Davy as an American grass; yet our botanists do not mention it as indigenous to our country. M'Mahon terms it the *swamp cock's-foot*, and says it grows well in swampy and moist soils. As it affords an abundant crop, it is hoped that some one acquainted with it will bring it into further notice.

Of the grasses named in the preceding table, the seeds of the following may be procured at the seed shops in our commercial towns, viz: Sweet-scented vernal grass, cock's-foot or orchard, tall oat, rye grass, red clover, lucern, sainfoin, timothy, upright bent, herdsgrass or red-top, and flat-stalked meadow or blue grass. The following native grasses seem particularly worthy of notice and cultivation, to wit: Tall fescue, American cock's-foot, purple fescue and hard fescue: and we might introduce from abroad, with the prospect of great benefit to our grass husbandry the seed of the meadow foxtail, meadow fescue, crested

dog's-tail, and probably of the marl grass, (*Trifolium medium*.) and trefoil, (*Medicago lupulina*).

We will endeavour to class the grasses of which the seeds can be procured in this country, according to the best data in our possession, for the uses to which they are best adapted, and to indicate the soils on which they respectively thrive. But before we do this, we will introduce Dickson's classification of grasses for different soils in Great Britain, which will show the quantity and variety of seeds sown to the acre in that country.

Clayey soils. Marl or cow-grass, 5lbs. ; trefoil, 5lbs. ; crested dog's-tail grass, 10lbs. ; meadow fescue grass, one bushel ; meadow fox-tail grass, one bushel. And where the three last cannot be procured, meadow soft grass, two bushels ; meadow cat's-tail or timothy grass, 4lbs.

Loamy soils. White clover, 5lbs. ; crested dog's-tail, 10lbs. ; rye grass, one peck ; meadow fescue grass, three pecks ; meadow fox-tail, three pecks ; yarrow, two pecks. Or where the second cannot be had, ray grass, one peck ; and rib grass, 4lbs. And in room of the last three meadow soft grass, half a bushel : timothy grass, 4lbs. ; marl or cow grass, 5lbs.

Sandy soils. White clover, 7lbs. ; trefoil, 5lbs. ; burnet, 6lbs. ; ray grass, one peck ; yarrow, one bushel. Or instead of the last, rib grass, 4lbs. ; ray grass, one peck.

Chalky soils. Burnet, 10lbs. ; trefoil, 5lbs. ; white clover, 5lbs. : yarrow, one bushel : or in its place, ray grass, one bushel.

Peaty soils. White clover, 10lbs. ; crested dog's-tail grass, 10lbs. ; ray grass, one peck ; meadow fox-tail grass, two pecks ; meadow fescue grass, two pecks ; cat's-tail or timothy grass, one peck. Or in place of the second, fourth and fifth, meadow soft grass, six pecks ; rib grass, 5lbs. : marl or cow grass, 4lbs.*

* Farmer's Companion, vol. 2, p. 633, 634

Our classification embraces,

- I. Grasses best suited to arable lands, and designed to alternate with grain and roots.
- II. Those best adapted for hay or meadows: and,
- III. Grasses which are most profitably sown for perennial pastures.

I. There are several descriptions of land which are much more profitably employed in tillage than in grass, particularly those that are dry or light, and which have little tendency to produce good herbage. Yet constant cropping with grain would soon exhaust them of fertility, without an expense for manure which few can afford. The system of introducing artificial or sown grasses, after two, three or four years' tillage, is happily calculated to avert the evil, and constitutes the basis of most of the late improvements in arable husbandry as well as farm stock. "The lands are thereby not only prevented from being so much exhausted as would otherwise be the case, and at the same time rendered fit for the growth of particular kinds of grain without the necessity of fallowing; but a much larger proportion of green and other food than could otherwise be obtained, is provided for the support of live stock." The grasses best adapted for this purpose, are the red and white clovers, luzern, sainfoin and the orchard, tall oat, timothy and rye grasses. Clover is the primary dependence on all soils which will grow it, and particularly where gypsum can exercise its magic powers. As vegetables are said to exhaust the soil in proportion to the smallness of their leaves, (the larger and more succulent these, the more nutriment the plant draws from the atmosphere, and the less from the soil.) clovers are entitled to the high commendation they have obtained among American farmers. But as these plants are liable to premature destruction by the frosts of winter, it is prudent and wise to intermix with their seeds those of some other grass more to be depended on. For this purpose.

On sands, light loams, and gravels—and these constitute the soils usually employed in convertible husbandry—the orchard grass, or tall meadow oat grass, appears best calculated to ensure profit. They grow early, delight in a clover soil, and are fit for the scythe when clover is in bloom—the period at which it ought to be made into hay. The hay from this mixture may be made before the harvest commences; and if the soil is good, a second crop may be cut almost equal to the first. If intended for pasture the second or third year, either of these grasses will afford more abundant herbage than timothy. Lucern may be sown on deep sand loams; and sainfoin on dry soils naturally calcareous, or on those which have been rendered so by marl or lime.

On clays and heavy loams, timothy may be sown alone, or those grasses named in the preceding paragraph, separate or mixed.

On wet soils and reclaimed swamps, as the only object of tillage *ought to be* to prepare the ground to be laid down in grass, the kinds indicated in the preceding remarks as suitable for such soils, and intended for meadow grasses, should be selected; yet, so scanty is our assortment, that we can only name timothy and herdsgrass.

II. MEADOWS. These may be classed under three heads, viz: low, or alluvial lands, on the banks of rivers, creeks and brooks; uplands, naturally moist, or of clay or heavy loam; and reclaimed bogs and swamps. These soils, to adopt a common term, are *natural to grasses*, while the expense of tillage and the uncertainty of a crop, render it most proper to appropriate them to grass. The objects, in stocking meadows are, to select those grasses *which yield the greatest burthen of hay, and afford the most nutriment for cattle*. When mixed seeds are employed, care should be taken to select those which can be most profitably cut at the same time. The impropriety of mixing timothy and orchard grass, for instance, will be apparent, from

observing that the last should be cut in the latter end of June, while the former continues to improve till the last of July. Timothy is undoubtedly the best grass which we can employ for meadows, on moist or tenacious soils. Herbsgrass and rough-stalked meadow grass often come in spontaneously. And if the timothy is left standing until it is ripe, seed enough falls to supply new plants.

For light loams, sands and gravels, the tall oat and orchard grasses are probably the best; and to these may be added red and white clover.

The great difficulty is to prevent the deterioration of meadows. This takes place from the better grasses running out, and giving place to coarser kinds, to moss, and to useless and noxious plants; aided, often, by a neglect to keep them well drained. The finer and more nutritious kinds thrive well in *moist*, though but few will live in *wet* soils. It is stated that the whole number of plants

	In wet meadows is 30; useful, 4; useless or bad, 26.
Do.	In dry meadows, 38; do. 8; do. 30.
Do.	In moist meadows, 42; do. 17; do. 25.*

Hence it is of the first importance to keep the surface soil free from standing water, by good and sufficient drains; and it often becomes necessary, and is in most cases advisable, on a flat surface, to lay the land in narrow ridges, at right angles with the ditches. Another precaution to be observed, is, not to depasture them with heavy cattle when the ground is wet and poachy. Harrowing in the fall has been found beneficial to meadows. It destroys mosses, and covers the seeds of grasses which have fallen, or may be previously sown, and thus produces a continued succession of young plants. In Europe, top dressings of lime, marl, compost, ashes, and yard manure are repeated at intervals of two or three years.† In Flanders, extensive application is made in this way, of the urine of animals, after it has fer-

* Armstrong's Treatise on Agriculture, p. 127.

† See Code of Agriculture.

mented, or been diluted. It is collected in cisterns under the stables, and adjoining the yards in which the stock are fed, summer and winter.* With us, the annual application of a bushel of plaster of Paris is found beneficial, on most lands not absolutely wet. The gypsum not only thickens the verdure with clover, but is of advantage to most of the other grasses. Stable manure should be applied only when it can be spared from the more profitable uses of tillage, as it is far more beneficial mixed with the soil than spread upon its surface. Its most economical application is in the form of compost, made by mixing it with bog earth, river mud, the wash from the highways, or other rich earth, at the rate of one load of dung to five or six of earth. If turned and mixed well, this constitutes a valuable top-dressing for grass grounds, and is best applied in the autumn. When these means fail to ensure a good crop of hay, it is time to resort to the plough, a course of crops, and re-seeding.

III. PASTURES. Here the object is to obtain those grasses which are nutritious, relished by cattle, and which supply green feed from March to December, or such a mixture as will give a succession of fresh herbage during the grazing season. The tall oat, rye and orchard grasses are best adapted to the lighter and drier soils, where the spontaneous growth of clovers and other indigenous grasses should be encouraged by top-dressings, or the application of plaster. In moist and stiff grounds, timothy and herdsgrass may be sown with the tall oat. Our observations, under the preceding head, in regard to draining, top-dressing, sowing seeds and scarifying or harrowing, lose none of their force when applied to pasture grounds. It is believed that, if once introduced upon our farms, the valuable grasses which we want would propagate themselves. If so, how important is it that we obtain them, particularly those which our seed shops already afford.

* See Radcliff's Flanders

We shall have room to make but one more extract from the New York Agricultural Journal, but this we could not omit on account of its interest. The apple borer, is certainly one of the most formidable enemies which the cultivators of the apple, the quince, and the mountain ash, or the European or American hedge thorn have to dread. It is equally destructive to them all. We say this on the presumption, that it is the same borer which attacks them all ; we presume it is, because there is some resemblance, though but a distant one, between the trees.

The correspondence between Judge Buel, and Mr. Say, settles the question, what the apple borer is. We have heard it confounded with the locust borer, and even with the insignificant operator, though a very destructive one, which attacks the peach tree. We shall insert Mr. Say's description and remarks on the enemy to the peach tree ; it is entirely satisfactory. It will be seen that the peach borer is an entirely dissimilar insect. The apple borer in its perfect state is a beetle ; the other a fly, in common language, with transparent wings. Its general appearance is more like the devils' fly, or libellula. From its colour I think it may be readily known by any who have curiosity to look for it, the remedies seem to be simple, and we have no doubt will be sufficient.

The Saperda Bivittata, or Apple borer.—Troy, Mount Ida.
April 27, 1825.

DEAR SIR,—I have sustained a great loss, in losing several hundred of my most promising young apple trees, just coming into a bearing state. They stood on a side-hill. I have had the ground ploughed this week, and yesterday set my men to level the earth around them, as it was banked up on the upper side. On removing the earth from the

upper side of the tree, we discovered the bark in a diseased state; and on a close examination, we found them all very much injured, many girdled entirely, others with from one to three inches of sound bark only left. On cutting in with a gouge, we find many of them eaten like a honey-comb, and have taken from them insects of the size of a large grub, in almost every stage, some looking like yellow grubs, some with wings and horns. They are such as I have never seen described in any book. My gardener thinks them young locusts; but I differ with him. They are, however, the most destructive insect that I ever saw attack trees of any kind. All my hands are engaged in gouging them out, and applying a composition,* with hopes of saving those that are not too far gone. I have preserved a number in a tumbler. It would be gratifying to me, if you would take a ride up, and see the insects, and the depredations they have made. I think it will be time well spent, as you expect to raise an orchard.

If I could have had the information I learnt yesterday and to day, by bitter experience, two years ago, I might most likely have saved trees which I would not have parted with for \$2000. Do not fail to come, if possible, and see me; it may be to our mutual advantage, and the public may be benefited by our experience. Perhaps you may know a name for the insects, which I should be glad to learn from you.

With sentiments of esteem,

PHILIP HEARTT.

To JESSE BUEL, Esq. .

* The application was "*medicated tar*," prepared as follows: Half an ounce of corrosive sublimate was dissolved in half a gill of gin; these were mixed with three pints of tar, and the whole thickened to the consistence of paint, by adding pulverised whiting or chalk. The earth being removed, the composition was applied to the trunk of the tree, above and below the surface. As the insect deposits its eggs soon after it takes its winged form, I have very little doubt but it will operate as an effectual protection.—*Editor.*

In pursuance of Mr. Heartt's request, I made him a visit a few days after the date of his letter, and witnessed the devastation made in his orchard. Several of the insects were taken from the trees in my presence. They appeared to have entered beneath the surface, and as the spring advanced, to have made their progress upwards; and several holes were noticed at from six to twelve inches above the surface, through which the insect had escaped in its winged state. On examining the tumbler in which several had a few days before been placed, I found that many had reached their perfect state. Dr. Eights, Jun. of Albany, examined them, and decided that they were the *Saperda bivittata*; but referred me to Professor Say, of Philadelphia, for more satisfactory information. Professor Say's answer is subjoined, as also his description of the insect, as found in the Journal of the Academy of Natural Sciences.—J. B.

Philadelphia, May 17, 1820

SIR,—I take the earliest opportunity to reply to your letter respecting the depredator on the apple tree. Dr. Eights has very correctly decided it to be the insect which I described under the name of *Saperda bivittata*, in the Journal of the Academy of Natural Sciences, vol. 3, p. 409. Common as it is, this species is but little known; and although constantly within the reach of our farmers, it has operated unseen, and in security. I do not know that any observer has published an account of its habits; and until these are known, all preventive applications are empirical.

You state that it leaves the pupa and becomes perfect in the latter part of April, and that the eggs are deposited beneath the surface of the soil. These two circumstances ascertained, I would recommend the application, early in

May or the latter part of April, of common bricklayer's mortar around the base of the tree, so as to cover completely the part, and its immediate vicinity, where the deposit is made. This preventive was successfully employed by Mr. Shotwell, against the attacks of the peach-tree insect, (see American Farmer, vol. 6, p. 14;) and I see no reason why it should not be equally efficacious in the preservation of the apple tree.

The family of insects to which this species belongs, is a large one, and particularly abundant in this country: I have now in my cabinet 130 species, all inhabitants of the United States. Almost all these different species are concerned in the work of destruction during their larva state, feeding in the interior of trees of various kinds, piercing them in every direction, and passing freely through the most solid parts of the firmest wood. These larvæ are whitish, of a soft consistence, generally deprived of feet, having a scaly head, provided with strong mandibles.

Much has been written on the subject of the Hessian fly. Mr. Worth has carefully observed the insect in its different stages, and has published an account of it. My notice of it was published in the Journal of the Academy of Natural Sciences, vol. 1, p. 45, (with a plate,) under the name of *Cecidomyra destructor*.

I shall receive much pleasure in communicating to you any information I may possess, on the subject of any of our animals that may interest you in the course of your useful inquiries; and in the mean time I remain,

Respectfully, your obed't servant,

THOMAS SAY.

J. BUEL, ESQ.

*Description of the SAPERDA BIVITTATA.**

Hoary; above light brown, with two broad white fillets.

*Journal of the Academy of Natural Sciences of Philadelphia, vol. 3, p. 402.

Inhabits the United States.

Body white : *eyes* fuscous ; a small spot on the vertex, and another behind each eye, light brown : *antennæ* moderate, slightly tinged with bluish : *thorax* light brown, with two broad white lines approaching before : *elytra* light brown, irregularly punctured ; a broad, white, longitudinal line on each, nearer to the suture than to the outer edge.

Length from one-half to seven-tenths of an inch.

A very pretty insect. In the larvæ state, it is very injurious to the apple tree ; boring into the wood.

DETACHED HINTS FROM THE NEW YORK AGRICULTURAL
MEMOIRS, WITH REMARKS,

In the treatise on gardening some quotations are made from the London Horticultural transactions, as to the effect of ringing in accelerating the production of fruit on young trees. It is there said "that the decortication, or the stripe of bark removed should not be larger than would fill up in *two*, or at most, *three years* in trees bearing *kernel* fruit, and in *one year* on trees bearing stone fruit."

Long experience has taught us, that all ringing, except of grapes is injurious, often fatal ; and if it does not fill up the *first* year, the limb so treated will die. It ought never to be used, except on a single limb, for the purpose of knowing what the fruit will prove.

Dr. Shadrack Ricketson, of Dutchess County confirms, by his own experience the practice of sowing timothy in the autumn and alone, without grain. It is well to have this practice now getting to be common with us, confirmed by judicious persons in other States.

Judge Buel has an interesting article on the raising a crop of Swedish turnips after a crop of clover, he has tried

it three years successfully. He gives the Swedish turnip to his oxen and cows at the rate of one bushel per day, beginning on the first of March. We are persuaded, that this course is a very profitable one for persons who have small farms, and that they will keep a greater stock in proportion, and in better condition, than some of their neighbours, who have a great farm negligently cultivated in the old fashioned modes. Of the value of roots to horned animals in winter, and spring, we can speak with confidence from long continued experience.

Philemon Halsted, of Westchester, recommends the following mode of harvesting Indian Corn. "Give up the old method of cutting the top stalks, and when the corn is sufficiently hard, or *when you cannot find* an ear soft enough to boil and then proceed to cut and stout your corn in the following manner. Bring the tops of two hills together without cutting, bind them with a few spears of straw, then cut and set up about enough to make four sheaves, if bound, then put a band of straw around the top, and then you may add as many more and bind the whole with two bands, *always keeping the bottom* of the stout open so as to admit the circulation of air. In gathering the corn, proceed thus, throw down the stout, unbind and begin to gather the corn. When you have stalks enough for a sheaf, bind them, and lay them aside until you have enough for a stout. By this you save all the silk, and small husks and underleaves of the corn which were all lost by the former practice of topping and gathering corn. He adds, that from careful notice he is satisfied, that it takes no more time than the old method.

A member of the Saratoga Agricultural Society, earnestly recommends the rearing of live fences or hedges. In situations, where stones are scarce, and timber expensive, they are valuable. This gentleman mentions our native thorns as suitable for live fences. We can only say, that

after 14 years trial, we have doubts whether either the Virginia thorn, or the English hawthorn will ever make in our country durable division fences. They are both subject, to a great extent, to the depredation of the apple borer, or some other of the wood eating insects, and are therefore unsafe. Whether the Cockspur thorn is or will be attacked by them we know not.

The best plant, so far as the experience of one of our fellow cultivators, Ezekiel H. Derby, Esq. will go, and he has tried it for many years, is in favour of the buck thorn. It makes a close, beautiful hedge, and is not subject to any disease or the depredations of any devourer, so far as we yet know. It is a *Rhamnus*. Species, *Catharticus*.

Mr. William Phillips, of Pennsylvania, has derived great benefit from the application of air slacked, old effete lime to peach trees, the effects according to his account have been very great. He puts about a peck of lime to each tree; he thinks it useful as a preservative against the insect so fatal to these trees. We have then two applications recommended, unbleached ashes and lime, and from our own experience are enabled to recommend both. We are not yet sure which has the preference. The lime and ashes should both be dug in, every spring. A friend suggests, that he killed his young peach trees by lime. Caution is needed in the application.

ON THE EFFECT OF STIRRING THE SURFACE OF THE EARTH, AS A RELIEF AGAINST DROUGHT.

This is a trite subject, and one, which we are aware has been long since settled by intelligent cultivators in all countries. It is very familiar to gardeners, and the cause of the superior production of gardens over field culture may be attributed in part to the more frequent application of the hoe and the spade. Yet it is true, that a very great number of farmers deny the proposition, and disapprove the practice.

They think it dangerous to plough and hoe, in a time of extreme drought and heat, while our own experience of 20 years has convinced us, that it is much superior as a remedy, against drought than watering in the limited manner, in which that must always be applied. There has never been a season in our memory in which there was a greater necessity for the application of *all* remedies against drought than the *present*. The drought was not only of longer duration, but it took place, when plants were the least able to resist it, not having sent their roots in quest of nourishment far, wide, and deep. The early foliage, also, is more tender, and more liable to wilt under a scorching sun and a drying wind.

In this extraordinary season, I had a small patch of early potatoes planted in a warm sandy soil purposely to procure an early crop; the soil was, at least, three quarters pure sand, mixed with some little loam, and having been manured for several years, it had some food for plants among the sand. The severe drought threatened a total loss of the crop. The potatoe stalks were feeble, drawn up, scarcely larger than goose quills, and I expected every day to see them wither; all hopes of a crop were abandoned. I thought, that they were the fair subjects of a *desperate* experiment. On one of the hottest, and driest days, I gave them a thorough ploughing, passing the plough four times, through each row; first ploughing two furrows from the hills, as near the roots as possible, without throwing out the seed potatoes, and then returning the loom, or earth, instantly back by two other furrows. No rain intervened for ten days. In three days after, the potatoes changed their colour, they started afresh, as if they had received the benefit of ample showers, while not a drop of rain had fallen.

The dews, which were abundant, settled upon the new turned earth, while, before the ploughing, no moisture had been apparent.

This last fact, though it cannot have escaped the notice of the most careless cultivator, has not been as yet explained. We can easily see, that a soil, rendered porous, would more readily and easily convey its moisture to the roots. It becomes, like a sponge, and is readily permeable, or rather readily permits the moisture to pass between its particles. But it is not yet understood, why it attracts the moisture. Perhaps, however, this may be owing to its presenting a much greater surface to the moist air of the night. The fact, however, which is what *most concerns us*, is settled. Perhaps some of the experiments of our distinguished countryman, Dr. Wells, a physician of London, who rendered himself distinguished by his remarks on dew, may tend to explain this fact, though it is not my purpose, now, to examine the theory.

Every man, who feels an interest in the question, can satisfy himself, at once, by stirring a small piece of earth, in a time of severe drought, and if he does not find it in the morning more filled with moisture, than the undisturbed ground in its vicinity, let him continue a disbeliever.

But there is another mode, and it is one, which I have never seen suggested, by which I apprehend the stirring of the surface, and making it light and porous, is beneficial in great droughts. It is this; light, porous bodies are bad conductors of heat; perhaps because they have more air between their interstices. The facts are familiar to us. Metallic bodies acquire an intense heat under the rays of the sun, so do stones in proportion to their density. The earth, when very compact, will become exceedingly hot, but garden loam, which is very porous, remains cool at noon day, two inches below the surface. I believe, therefore, that moving the surface, and keeping it in a light and porous state, enables it to *resist the heat of the sun's rays*, that the air between the particles of earth communicates the heat more slowly, than the particles themselves do, when in close contact.

Such is my *theory*; but I am an enemy of theories, I always distrust them, I look only to facts; and having observed, that a slight covering of half an inch of sea weed would preserve my strawberries from drought, which can only arise from its lying so loose on the surface, I have been led to infer, that the *undoubted fact*, that soil in a loose pulverized state resists drought, is *owing to the same cause*, to wit, the slowness with which the heat of the solar rays is communicated to the roots. But be the theory sound, or unsound, I am persuaded, that every farmer will find that the free use of his plough, and hoe, in times of severe drought, will be of more value to him than as much manure, as that labour would purchase. I have been always convinced from my experience as an horticulturist, that the great secret of cultivation consists in making the soil porous. In raising exotic plants, we know it to be true, and our flower pots are always supplied with soil, the most porous, which we can obtain. The farmer may borrow light from an occupation, which he looks upon with disdain, but which serves to elucidate and explain the secrets of vegetation. J. L.

NOTE BY THE EDITORS.—Several articles prepared for this Number were necessarily omitted after being sent to the press, as those already in type completed the usual number of pages to an half volume. The last Number overran the usual size. It is probable that this Journal will hereafter be published at more distant intervals. The establishment of the New-England Farmer, a most valuable paper, has rendered the frequent publication of this Journal of less importance. If we have even in a small degree contributed to the excitement of an interest in Agriculture, we are amply rewarded.

Works in Press by Wells and Lilly.

SECOND EDITION OF

OBSERVATIONS ON THE DISEASES OF FEMALES
which are attended by Discharges; Illustrated by Copper-Plates of
the Diseases, &c. By CHARLES MANSFIELD CLARKE, Member of the
Royal College of Surgeons. Surgeon of the Queen's Lying-In Hos-
pital, and Lecturer on Midwifery in London.

IMPROVED EDITION

OF

GOOD'S STUDY OF MEDICINE.

MESSRS. WELLS & LILLY, of Boston, have lately received from London, a new edition of this invaluable work, (greatly improved and enlarged,) which has just appeared. They have it now in press, and expect to publish it next month.

Two editions of Good's *STUDY OF MEDICINE* have, within less than two years, been sold in this country: a third is now printing in Philadelphia, but will be only a copy of former editions, and of course will contain only their substance. On the contrary, the one now in press by Wells & Lilly will contain the *Author's latest improvements, and emendations*, which are numerous and extensive, and which must greatly enhance the value of *this* in comparison with *other* editions. It will be printed on a large and distinct type, and will likewise contain the marginal references, (not in former editions) which are all-important—it being a book of constant reference to the Practitioner. This will contain upwards of thirteen hundred pages more than the former editions.

The Study of Medicine having been extensively circulated, it is presumed that most Physicians are now fully convinced of its superior merits, and of the high literary and professional character of the Author. To those who have examined the work nothing need be said in its commendation—it speaks sufficiently its own praise. To others, the fact that this is a *fourth* edition, (all in the course of two years,) must be undeniable proof that the work is one of no ordinary standard. It is, to use the words of an eminent physician of our own coun-

try, a work "which will be read and admired so long as Medicine shall be studied as a science."

This edition of the **STUDY OF MEDICINE** will be comprised in five large octavo volumes—containing 3,300 pages,—and will be furnished to subscribers at the low price of \$10 a set in boards, or \$11,50 a set bound and lettered. The work will be sent to any part of the United States, if the amount of the subscription is received with the order.

JOHNSON'S MEDICO-CHIRURGICAL REVIEW for October, 1825—published in London, and just received in this country—contains on the last page the following

N.B.—The Review of Dr. JOHN MASON GOOD's *second edition* of THE STUDY OF MEDICINE, will, we hope, appear in our next. We may state, in the mean time, that this edition has received great improvements.

WELLS & LILLY's new edition of GOOD'S STUDY OF MEDICINE will be ready in a few weeks—four volumes are printed—and the fifth is in press.

(☞) This edition will contain the Author's latest improvements and emendations, which are numerous and extensive, and which must greatly enhance the value of this in comparison with other editions.

Wells and Lilly

WILL PUBLISH, BY SUBSCRIPTION,

A PRACTICAL TREATISE ON THE LAW OF EVIDENCE, AND DIGEST OF PROOFS, IN CIVIL AND CRIMINAL PROCEEDINGS.—By THOMAS STARKIE, Esq. of the Inner Temple, Barrister at Law, Downing Professor of Common Law in the University of Cambridge. 3 vols. royal 8vo. With Notes and References to American Decisions.—By THERON METCALF.

WELLS & LILLY,

ARE PUBLISHING BY SUBSCRIPTION,

UNIVERSAL GEOGRAPHY, OR A DESCRIPTION OF ALL THE PARTS OF THE WORLD, on a New Plan, according to the Great Natural Divisions of the Globe ; accompanied with Analytical, Synoptical, and Elementary Tables. By M. MALTE-BRUN. Improved by the addition of the most recent information, derived from various sources.

THIS work is publishing in parts, or half volumes. It will be comprised in 14 parts, or 7 volumes, large 8vo. Price \$1 50 a part—\$21 the set.

Ten parts, (5 volumes,) are now printed, which makes the work complete so far.

Contents of the volumes published :—Vol. I. The Theory, or Mathematical, Physical, and Political principles of Geography. Vol. II. The description of Asia, with the exception of India. Vol. III. The description of India and Oceanica. Vol. IV. The description of Africa and adjacent Islands. Vol. V. Description of America, and adjacent Islands.

The demand for this work has been so great, as to exhaust a first edition before the printing of ten parts was completed. A second edition has been commenced. There can be no doubt of the great value of the work, and that it is by far the most extensive, accurate, and interesting work which has ever been published upon the subject of Geography. The literary journals of Europe universally bear testimony to the great merit of the author. The Geography of the United States has been carefully revised, and such corrections and additions made as appeared necessary. The character of Malte-Brun's Geography is now so well established, as to render it unnecessary to enter into any particular examination of its contents. Every part of it has been elaborated with the utmost care and diligence : and it is impossible to peruse a single chapter without being satisfied of the variety and solidity of the author's acquirements. References are constantly given for every fact of any importance ; and the author's intimate acquaintance with the German, Danish, and other northern languages, as well as with those of the more southern countries of Europe, has enabled him to avail himself of the information embodied in various works of very great merit, which had not been consulted by any preceding French or English writer on Geography.

"M. MALTE-BRUN is probably known to most of our readers as the author of a systematic work on Geography; he is, besides, the editor of a periodical digest under the title of *Nouvelles Annales des Voyages de la Géographie, et de l'Histoire*; the first as much superior to the compilations of our GUTHRIES and PINKERTONS, as the other is to the gaudy productions of our TRUSLERS and MAVORS."—*Quarterly Review*, No. 52.

"The translation of this valuable, we had, almost said, invaluable work, having now advanced a great way, it is full time that we should do our duty in bringing its merits under public consideration. We have before us four complete volumes, and the first part of the fifth volume, which has just issued from the press. 'Its design,' says the original preface, 'is to bring together, in a series of historical discourses, the whole of Ancient and Modern Geography, in such a manner as to furnish the reader with a lively picture of the whole terraqueous globe, with all its different countries—the memorable places which they contain—the tribes of men by which they have been successively peopled, and those which at the present moment are its inhabitants.' It appears an immense undertaking, when we consider how many varied details require to be combined in a work of moderate size.'

"But immense and difficult as it is, the author has done and is doing it ample justice. It is at once a system of geography for every-day use, and for every common purpose; and at the same time an example of the most enlarged philosophical views. It is alike calculated to gratify those who read merely from natural curiosity, and those who seek its pages for the more definite purposes of education and scientific intelligence."

"The first volume is devoted to a luminous philosophical theory of geography—an appropriate foundation for the succeeding volumes, which treat separately of the various quarters of the world—as the second and half the third Asia; the last moiety of the third (what is here called Oceanica,) the regions situated in the great ocean between Africa, Asia, and America; the fourth Africa and its adjacent islands; and the fifth, as we see from its commencement, America. Thus we have two, we might almost say three, quarters of the globe, complete in the first four volumes, and the remaining quarters, America and Europe, in a fair state of progress. But it is not so much the excellent arrangement of this work which claims our approbation, as its descriptive and animated style. Geography ceases to be a dry study under the pen of M. MALTE-BRUN. Instead of tiresome technical expositions, the reader is borne along by pleasant paths to acquire every degree of knowledge which can be desired; and, after a long sitting, will be apt to close the book of instruction with impressions similar to those he would have felt if he had been reading amusing travels or an entertaining history. 'We shall not (the author tells us) even scrupulously deny ourselves and our readers the pleasure of occasionally mingling our topographical descriptions with passages of history, or with anecdotes tending to illustrate manners, and often serving to fix in the memory names of localities, which otherwise it would be difficult to retain. There is no reason why we should refuse to pick up a flower which obtrudes itself on our view. A description of the world should resemble the world itself, in which the most arid deserts present here and there a limpid fountain, or a refreshing shade.'

"But however highly we may estimate this publication, which is, in our opinion, infinitely superior to any thing of its class which has ever appeared, it is not of a kind which we can illustrate by extracts. We can merely state that it is admirable in its original form, that it is well translated, that it is printed in a fair style, so as to fit it not only for libraries, but for families and schools; and that, in fine, it is a work that neither library, family, nor school, should be without."—*Literary Gazette*, No. 405.

"The portion of this great work which lies before us, is the first part of the fifth volume. Before proceeding to notice it more in detail, it may be as well very rapidly to apprise our reader of the general outline of his plan. The work, then, in the original, is preceded by a very complete history of geography: this portion of the work the English translators have very judiciously determined to publish last, that they may be enabled to supply any facts which may have escaped the attention of M. MALTE-BRUN, and to bring down the history to the latest period. Then follows a very admirable survey of mathematical, physical, and political geography, which constitutes the earlier numbers of this translation. Then begins the geography of particular countries, in compliance with the natural divisions into which he had previously found the surface of the earth to be divided; he considers the surface of the earth under five great divisions, Asia, Africa, America, the fifth consisting of the vast island, or rather continent, of New Holland, and the islands of the Australasia. He begins with Asia, and Europe is reserved for the last place.

"It may be necessary to add, that the translators, availing themselves of every new source of information which may have been opened since the publication of M. MALTE-BRUN's work, and of materials which he could not obtain, embody these in their translation. And hence some portions of the work are almost entirely re-written: thus the geography of Hindooostan is almost entirely new; so that of the United States, contained in the present number, has manifestly received very considerable additions from the geography of Dr. MORSE, the venerable geographer of America, and from the recent travels and researches of Englishmen and Americans. And, in fact, every part of the work has been enriched by the addition of much new and important information."—*Monthly Critical Gazette*, No. 6, p. 504.

